

THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

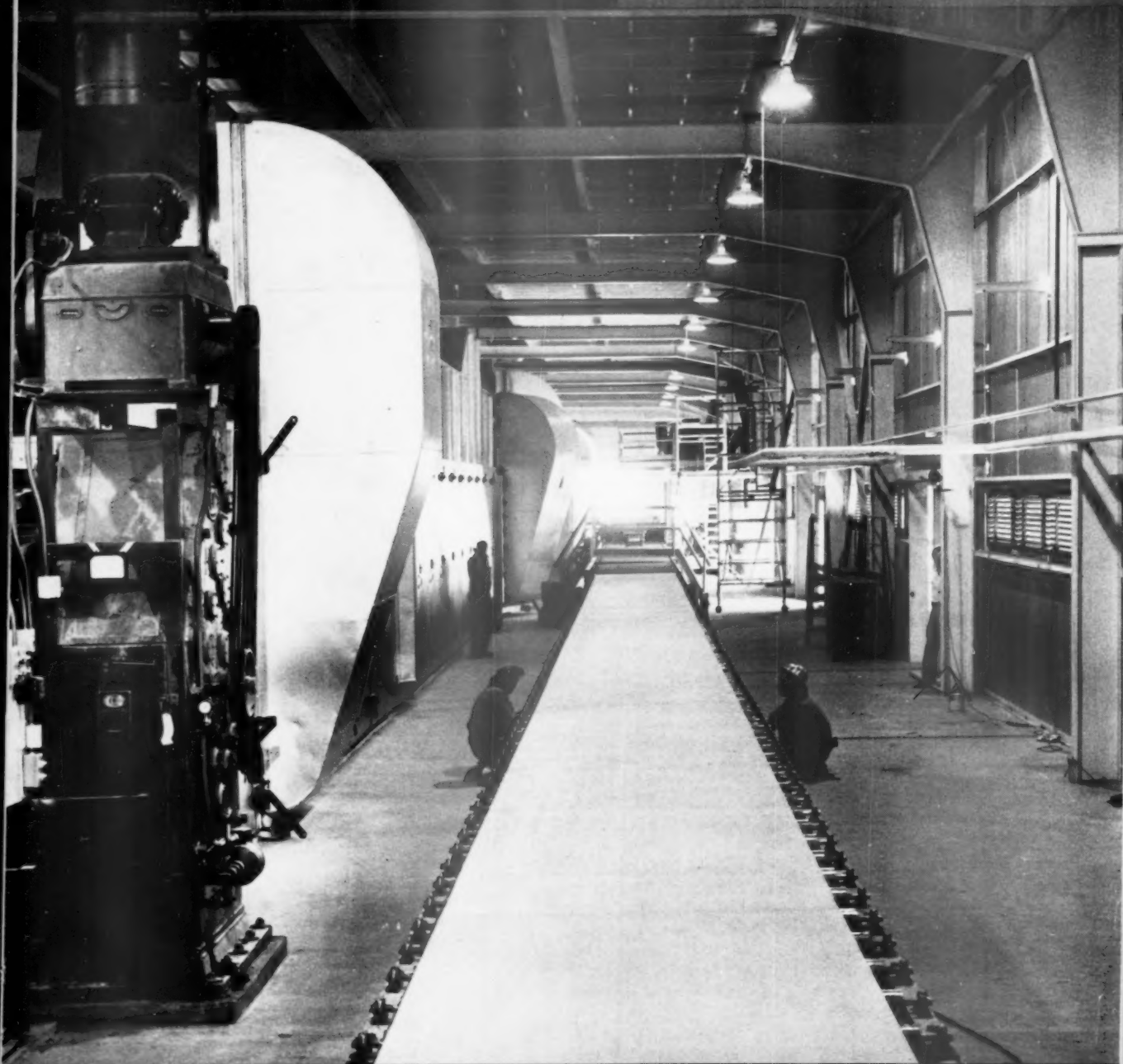
LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

First Lepol System
Wet Process Cement Kiln page 68

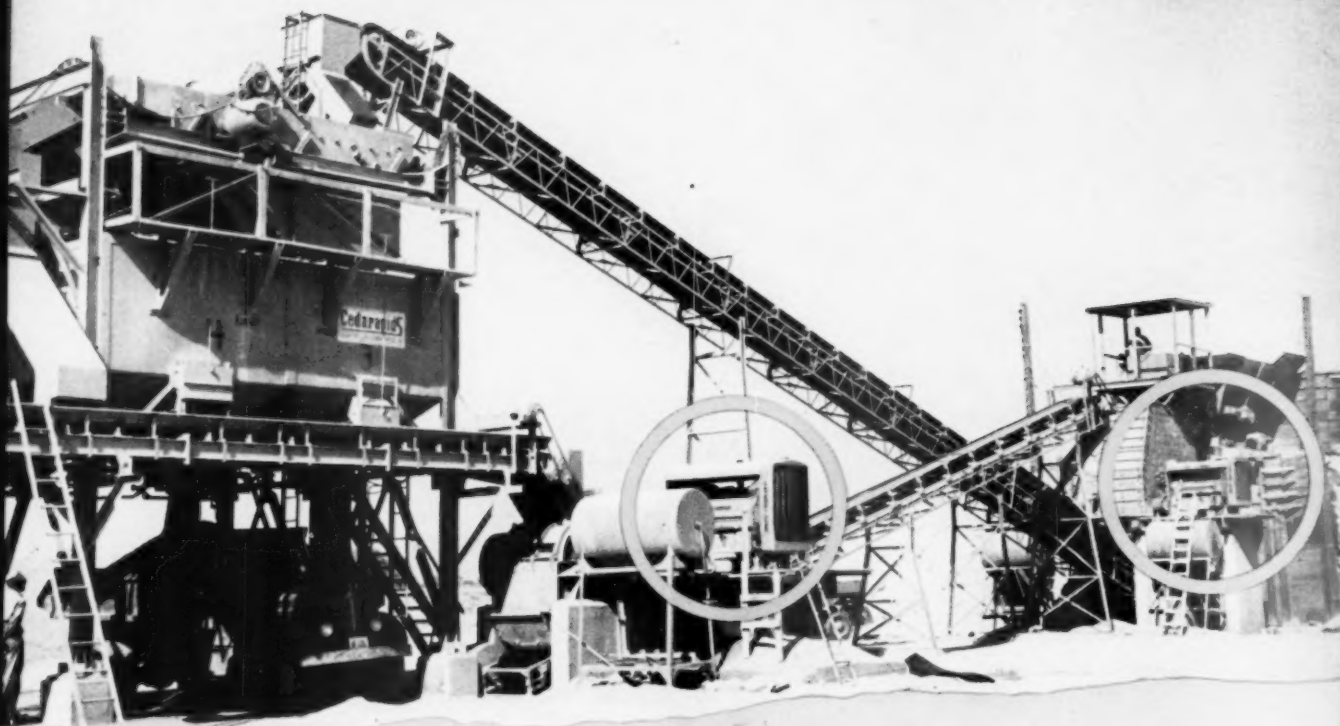
Precision Controls in
Gypsum Plant page 72

Sand-Gravel Industry's
Largest Power Scraper page 89

Safety Congress Meeting page 94



Dryer and wallboard conveyor belt in new plant of Kaiser Gypsum Co., Inc.



"NO QUESTION WHAT POWER I WANTED FOR THIS PLANT"

THE significance of Ray Cook's remarks is largely hidden. You can see only one of the two Caterpillar D326 Engines that power the 40" x 40" Cedarapids impact breaker for Ray Cook Construction Co., four miles northeast of Ames, Iowa. Also in view is a Cat® D337 driving a hammermill. Behind the scenes, a D13000 Electric Set furnishes power for three 4' x 12' Iowa screens, a feeder, a 36-inch 100-foot conveyor, three 24-inch conveyors of 95 feet, 50 feet and 10 feet, and two bin-vibrators. In addition, a D3300 powers a compressor for drilling two-inch holes 10 feet into rock in 4½ minutes!

The D3300 in the compressor has about 5000 hours on it. "We've never had a wrench on this engine," says Ray Cook, "except to put in one injector."

Ray Cook bought his new engines on the basis of past Caterpillar performance. He also owns four Cat track-type Tractors. "We've used Cat-built equipment for years and years," he says, "so there wasn't any question what power to buy for *this* plant."

The performance of his Caterpillar-powered plant has justified Ray Cook's faith. The plant produces 150 tons per hour of ag lime, asphalt stone and Class A concrete road stone. In this dusty, ten-hour-a-day work, he particularly likes the long life and low service costs of

Caterpillar Diesels. These rugged units are built to deliver without pampering or down time. And their special fuel-injection system means full and foul-free power on money-saving No. 2 furnace oil.

There are 12 sizes of engines and electric sets, to 500 HP and 315 KW. Leading manufacturers of crushers, excavators, compressors and other rock and gravel machinery can furnish Cat Engines as part of their equipment. And, your Caterpillar Dealer can furnish replacement engines and electric sets. See him today—and count on him for fast, skilled service and genuine factory parts.

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PERFORMANCE**

RESEARCH KEEPS

B.F. Goodrich

FIRST IN RUBBER



Rubber belt drains off water to speed ore washing

RIDING up that conveyor belt is crushed iron ore, still sopping wet from the washing that removes sand or silica.

As you can see, this is no ordinary belt. If it were, water seeping down through the ore would form a pool at the bottom of the belt trough, and wash the ore down the 20° incline. That's why the Riffle Grip belt you see here was recommended by B. F. Goodrich.

You'll notice that the Riffle Grip belt has a series of rubber ridges molded into the cover. It's this tread with angular steps that holds the ore in place, and, at the same time, channels water to the edges of the belt where it flows off.

B. F. Goodrich engineers developed this belt to solve a gold dredging problem. And it is such an improvement over ordinary belts that it's now widely used in mining operations, sand and gravel plants, and other places where wet materials must be carried up steep inclines.

This same belt works equally well on jobs where moisture must be held. By changing the incline angle and the troughing idlers, the steps become a series of horizontal ribs which can carry such sloppy materials as wet mixed concrete and keep the water from draining away.

With its ability to shed water or retain it, as the job requires, the B. F. Goodrich Riffle Grip belt is making many mining and processing jobs cheaper, more efficient. Your BFG distributor will give you complete details on how this unusual belt can solve your wet material handling problems. Or write The B. F. Goodrich Company, Dept. M-343, Akron 18, Ohio.

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ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

December 1954



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Jorge Boise

Automatic Controls in Newest Gypsum Plaster and Wallboard Plant	72
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Kaiser Gypsum Co., Inc., Seattle, Wash., plant has annual capacity of 100 million sq. ft. of $\frac{1}{2}$ -in gypsum board products and 35,000 tons of plasters. Precision, automatic weighing controls for materials are an outstanding feature of plant

Walter B. Lenhart

Largest Power Scraper Installation in Sand and Gravel Industry	89
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Pioneer Sand and Gravel Co. plant at Steilacoom, Wash., has field conveyor system delivering 480 cu. yd. per hr. Power scraper bucket capacity is 12 cu. yd.

New Problems Command Attention of Safety Engineers	94
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Cement and Quarry Section, National Safety Council, in papers and addresses cover problem of noise reduction and contributions to safer operations through machinery improvements

Hubert C. Persons

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National Slag Association annual meeting in Washington, D. C., reveals substantial increase in sales and new outlets for products

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CONCRETE PRODUCTS—

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New block plant of Oswalt Co., in Broadview, Ill., incorporates many automatic controls to assure quality and accuracy in finished product. Weigh batchers and mixers enclosed to control dust dispersion

Hubert C. Persons

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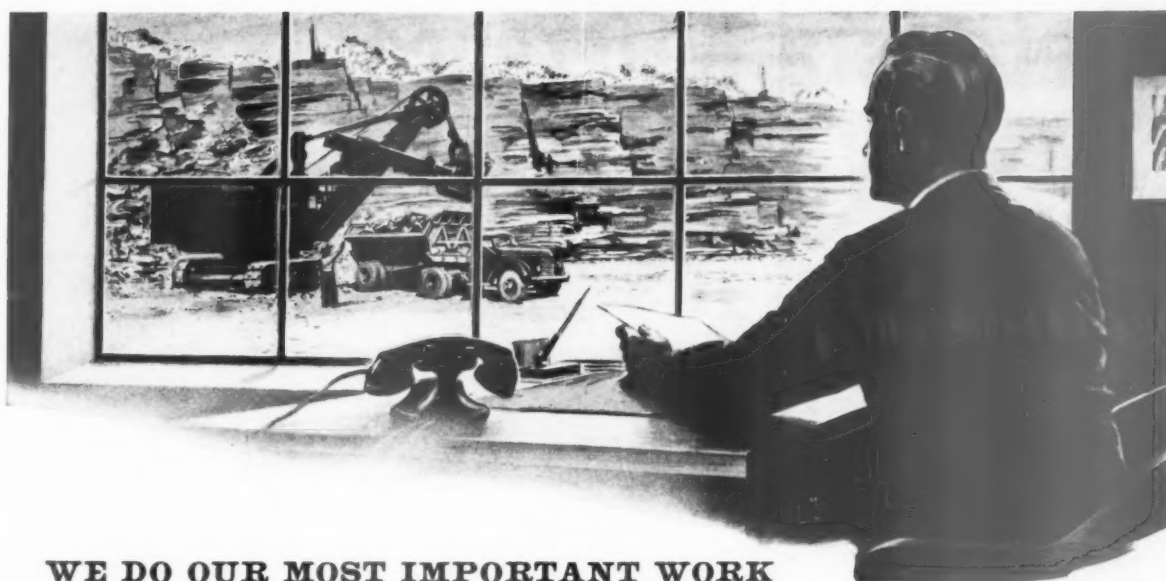
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WE DO OUR MOST IMPORTANT WORK FOR MEN WHO DARE TO THINK AHEAD

A CYCLE HAS ENDED. In a dozen years the first wide swing from rail to pneumatic-tired hauling in quarries has carried around the world. Everywhere the great cement and aggregate producing plants are hauling on rubber. Speed and flexibility far outrange the scope of ponderous old rail systems.

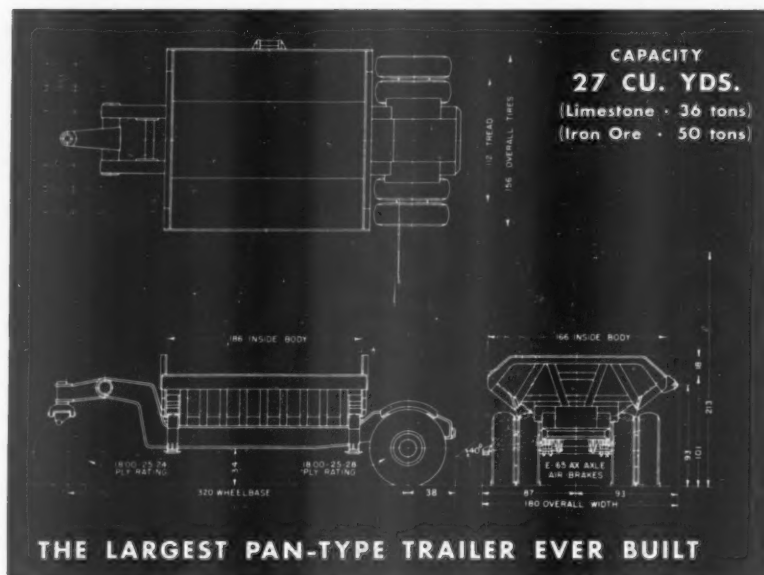
Through the long cycle of change the spur for every forward step has come from men who dared to think ahead. From everywhere they sought us out to work with them toward new and better means of transportation. The constant spearhead has been the now famous EASTON pan-type side-dump trailer.

No two installations of EASTON equipment have been alike. Progress in design, construction, capacity, speed, and method of application runs at the swift day-to-day pace set by the men for whom we work. For EASTON it has been necessary to maintain complete flexibility and adaptability in manufacturing in order to meet new, unprecedented demands with immediate action.

Experience has taught us that side-dumping trailers, truck bodies, and tandems cannot be regarded as standard equipment to be delivered from available stock. While some practical and economical standards have been developed, such as the sturdy E-series axles, we have come to accept side-dumping as an idea . . . a proven, workable idea in which our background of experience provides tangible footing for the next step ahead.

• • •

NOW WE SEE, with the men who dare to look ahead, the unfolding of a splendid new panorama of industrial opportunity. We offer, from the measure of our experience, a patient, cooperative effort toward higher levels of performance and sound new economies with the side-dump idea.



Now in production at EASTON is the new Model TP-2736 Pan-Type Trailer, the largest side-dump ever built. The trailer rated at 36 tons capacity for limestone will handle 50 tons of iron ore with only minor variations in design. A tandem potential of 75 to 100 tons is indicated. The dumping mechanism for this great new trailer will be based on EASTON's exclusive background of experience in electric overhead dumping systems for mine and quarry service.

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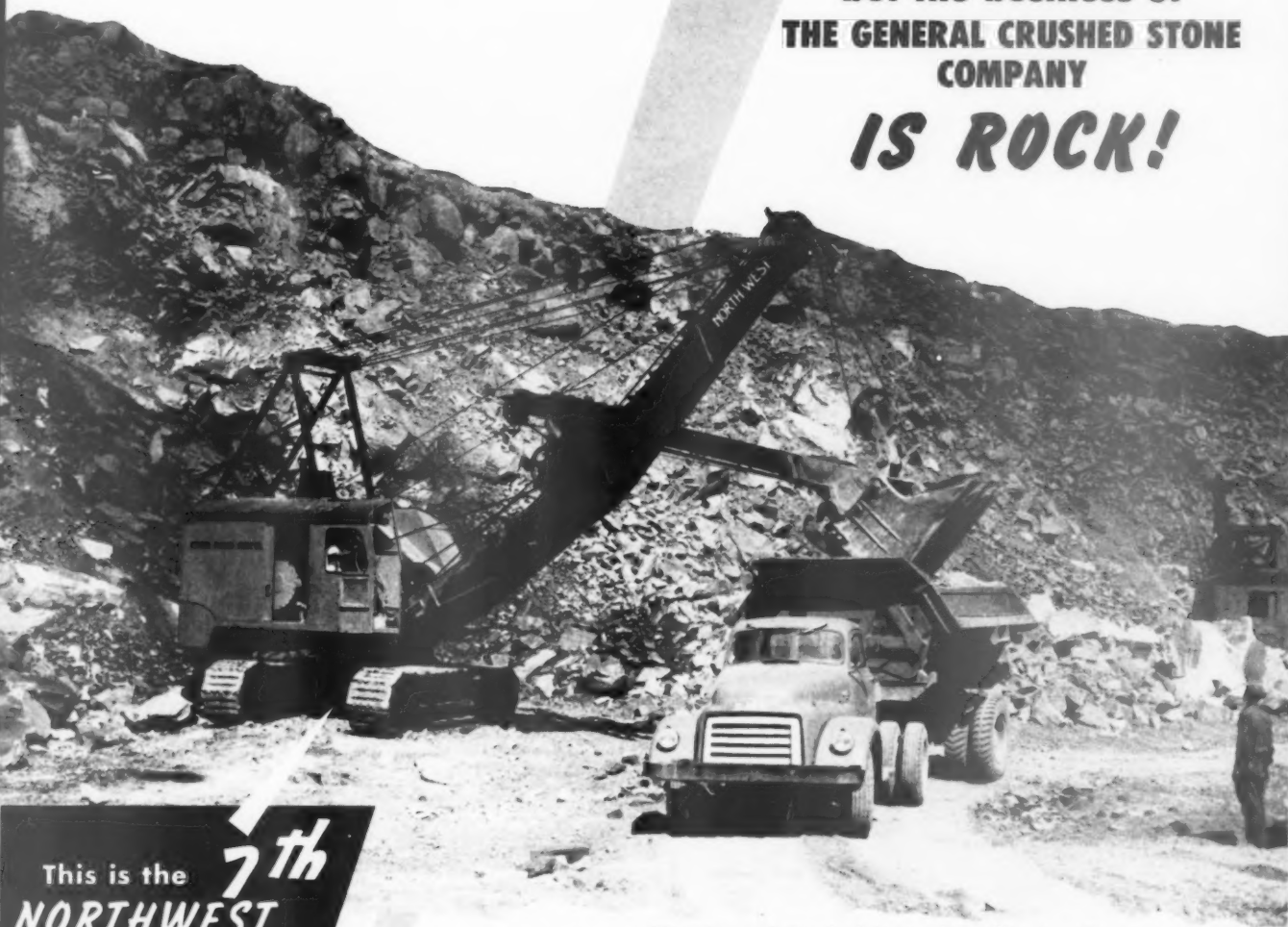
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Milwaukee 1, Wisconsin

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The General Crushed Stone Co. of Easton, Pa., puts their machines in material that will really test equipment. Look at the samples in the picture. It is service in stuff like this that has made The General Crushed Stone Co. buy their 7th Northwest and their 5th 80-D.

Northwests are *real* Rock Shovels! Get up on a Northwest sometime if you know operation. Get the feel of the controls yourself. Feel that crowd take a-hold. The dipper goes right on through as the hoist takes it up—no "re-starts" are required here. It's a full load in one cut. Remember the Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste—force that puts greater effectiveness at the dipper lip for handling tougher digging and producing more output.

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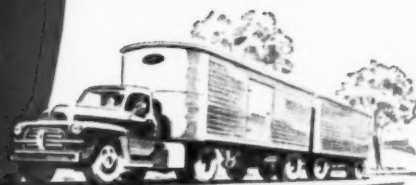
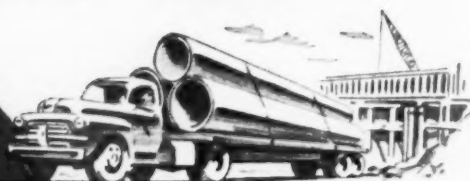
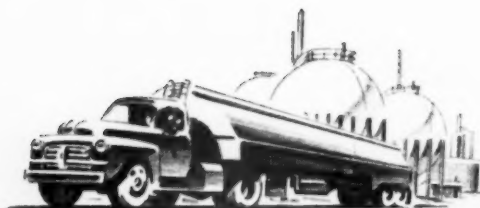
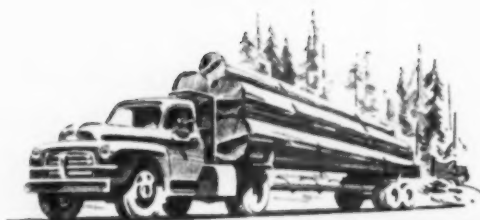
You can plan to have a Northwest. Now is the time to find out about Northwest design and operation. Why not talk it over with a Northwest man?

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check lifting and churning of material by applying power as a direct crushing force. The result is a more uniform product at less cost per ton.



TRAYLOR BELL HEAD and CURVED CONCAVES

place the crushing zone of smallest volume here, well above the opening where packing and choking commonly occur. Capacities of all succeeding zones are progressively greater . . . free discharge is assured.

The self-tightening bell head and curved concaves of a Traylor TY Reduction Crusher will increase capacities of your plant by checking choking and packing. Efficient application of crushing force produces a better, more uniform

product with a lower percentage of oversize and waste fines . . . reduces power waste and costs to a minimum. Mail coupon today for free bulletin giving complete details on efficient, economical Traylor TY Reduction Crushers.

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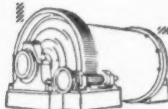
Primary Gyratory Crushers



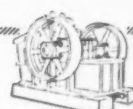
Rotary Kilns



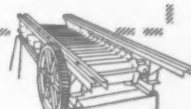
Secondary Gyratory Crushers



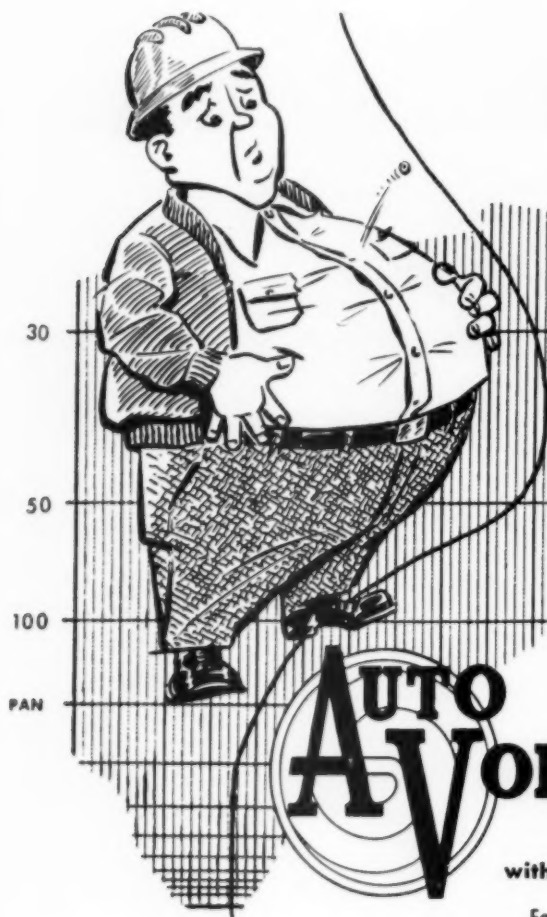
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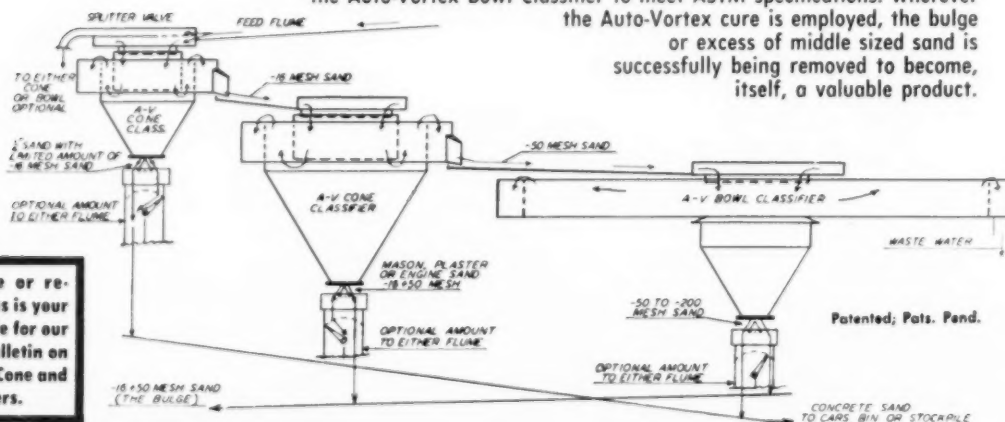
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And Gulf provides excellent engineering service to make certain that the right lubricants and fuels are used for each unit and climatic condition.

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Western Precipitation is unsurpassed in the all-important factor of "know-how" in BOTH the electrical and mechanical fields . . . knows from years of first-hand experience whether your particular problem can best be solved by mechanical or electrical methods—or by a combination of the two . . . can give you a direct and unbiased recommendation on the matter . . . and then can provide the complete installation under one responsibility, one overall performance guarantee, even where Combination Multiclone-Precipitator (CMP) installations are made!

Western Precipitation products and services include . . .



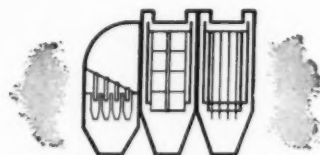
COTTRELL Electrical Precipitators

... the most efficient recovery equipment for high recovery, long life, low maintenance on practically any type of suspensions, wet or dry. COTTRELLS can be designed to handle a few c.f.m.—or millions—with equal ease, and at virtually any operating temperature. Recovery efficiencies closely approach 100% recovery, if desired, with very low draft loss, minimum power costs and negligible labor costs. By all standards, Western Precipitation COTTRELLS give highest recovery at lowest cost per-year-of-service!



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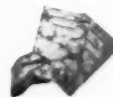
... combine, in one compact installation, both mechanical and electrical recovery principles so that maximum benefit is obtained from the advantages inherent in each method. The MULTICLONE section centrifugally removes the larger and heavier suspensions (down to a few microns in diameter) . . . and the COTTRELL section then electrically removes the very small particles remaining in the gases. Thus, the bulk of the recovery is obtained with relatively low-cost equipment, and the final clean-up is obtained with equipment having unusually high recovery efficiency—approaching theoretically perfect, if desired.

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GM DIESEL
CASE HISTORY NO. 5310-1X



OWNER: American Zinc Company, North Friends Station Mine, Mascot, Tenn.

INSTALLATION: GM 4-71 Diesels powering 3 Koehring Dumptors. Units haul 8½ tons of rock and ore on 1100-foot run up 11½% grade to surface.

PERFORMANCE: GM Diesel-powered units help 20-man crew produce 500 tons of ore per day. Use of rubber-tired equipment cut cost of access shaft construction by 70%.

It Pays to STANDARDIZE on



GM DIESELS GO UNDERGROUND *to make trackless mining pay*

One of the world's most efficient small underground mines, the American Zinc Company's new North Friends Station mine is proving the economy of trackless operation. With a fleet of three GM Diesel-powered Koehring Dumptors handling the haulage, the mine is producing 500 tons of ore per day—about 25 tons of ore per man-shift. Mine Foreman Bill Armstrong says: "These units run along month after month with almost no repairs. Our costs are much less than we expected."

General Motors 2-cycle Diesels are just as much at home underground as on the surface. Two-cycle operation with uniflow blower scavenging

gives more complete combustion of low-cost fuel for higher efficiency and cleaner exhaust. Used with exhaust scrubbers and adequate ventilation, mine air stays well within permissible limits. And two-cycle operation means faster acceleration, quicker response to controls, faster haul cycles for increased production.

There's a GM Diesel for every kind of mining job. Specify GM Diesel power in *your* equipment. It will save you money.

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FOR OPEN PIT DART MODEL 35-SA

MODEL 35-SA—35 ton end dump truck powered by a 300 H. P. Diesel Engine, 50,000 lb front axle suspended with a hydraulic strut, 85,000 lb triple reduction, full floating, full planetary rear axle, 20" x 9" air brakes. Steering by hydraulic power on a center bearing cushioned by captive air in a hydraulic-air strut. Torque converter with 4 speed transmission, 18.00 x 25, 32 ply tires all around. Approx. wt. with body and load, 52,600 lb.



OR UNDERGROUND DART MODEL 18-S-UG-S

MODEL 18-S-UG-S—18 ton underground truck powered by 275 H. P. Diesel Engine with torque converter and fully reversible transmission. Hydraulic motor operates steel apron conveyor. Equipped with exhaust scrubber. Hydraulic steering. Operates as shuttle car. Height, 66"; width, 10' 8"; length, 28'. Approximate weight, 39,000 lb.



Dart cuts costs!



DART 20S



DART 35SA



DART 10S



DART 75TA

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Kansas City 8 Missouri
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For the majority of its 51 years of engineering and building specialized heavy duty trucks, The DART TRUCK COMPANY has served the Mining Industry.

Dart engineering has produced many "firsts" in design which today are standard. The DART line includes models for mining ranging from 10 ton capacity through 75 ton capacity . . . the most complete line of off-highway trucks . . . all are built to provide maximum haulage with minimum maintenance, even under the most rigorous conditions.

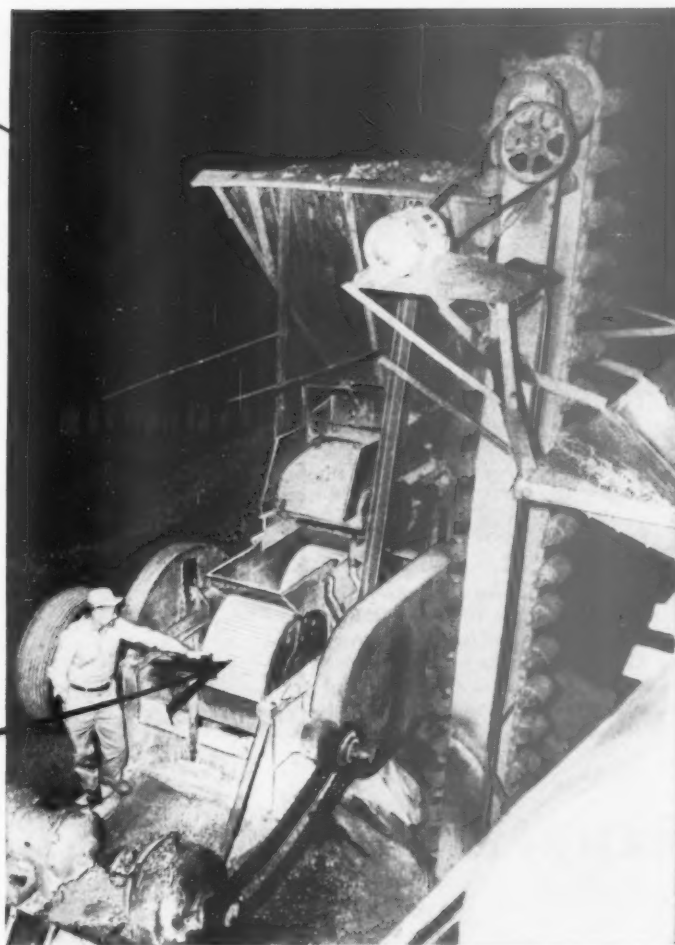
Crushing Life
Increased 500%

by

**Hard-
Facing**

with

HAYNES 90 rod



Hard-facing the rolls in this crusher rig with HAYNES 90 Rod makes them more than 5 times more durable. Two sets of rolls are used to crush rock from 3-in. down to $\frac{1}{2}$ -in. screen size. They handle up to 26 thousand tons of rock with a minimum of repairs—despite severe wear from abrasion and impact. Other hard-facing materials wore out before 5,000 tons of rock were crushed.

Since HAYNES 90 Rod was adopted as the standard material on this job, production increased, down-time was reduced, labor and maintenance costs were cut, and less hard-facing material was needed per ton of rock crushed. This is typical of the kind of savings that can be realized by hard-

facing with HAYNES alloys.

HAYNES hard-facing alloys give outstanding service when used to protect parts in crushers, shovels, tractors, trucks, conveyors, and other metal parts exposed to wear from abrasion, impact, corrosion, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including: HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt-base rods, and HAYSTELLITE tungsten carbide tube rods. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See...

or

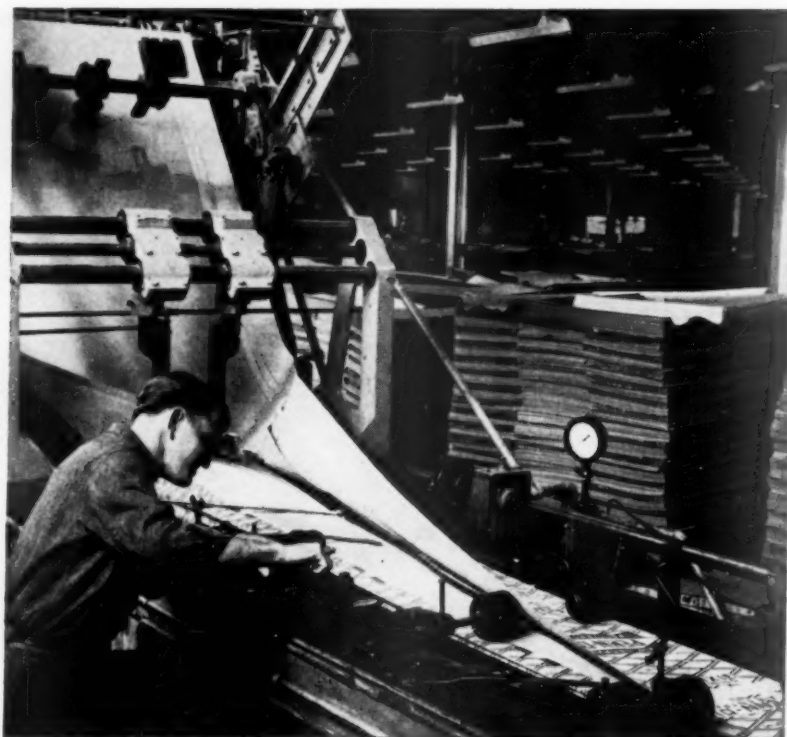
Write...

Your local Haynes Stellite Dealer

to Haynes Stellite Company

"Haynes," "Haynes Stellite," "Haystellite" are registered trade-marks of Union Carbide and Carbon Corporation.

Herman Johnson, who is in charge of this big tuber at the Bemis Multiwall Plant in Peoria, joined Bemis in the tubing department nine years ago and worked up to his present capacity. His job is one of the most important in a multiwall plant.



Experienced Hands Run Our Tubers!



Bemis

General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

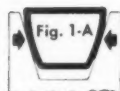
Tubers—the big machines that fold and paste the multiple kraft plies—are the heart of multiwall bag making. Running, they look pretty automatic. But you don't learn to run a tuber by reading an instruction manual. It takes long experience, knowing eyes, deft hands, to keep the plies properly nested and paste properly applied . . . and to control the many other factors that affect the performance of the finished bag. We've been making multiwalls for twenty-seven years . . . so there's plenty of bag-making experience in our twelve multiwall plants strategically located coast to coast.





This simple idea saves money in V-Belt Costs

*You can
prove it in two minutes!*



To prove how the **CONCAVE SIDES** of GATES VULCO ROPES *save money*, just make this simple test—

Bend *any* V-Belt that has *straight sides* (Fig. 1) and—as the belt bends—*feel* the sides *bulge out* (Fig. 1-A). This out-bulge concentrates the wear at the points shown by arrows—and this naturally shortens the life of a *straight-sided* belt!

Now bend a Gates Vulco Rope with **CONCAVE SIDES** (Fig. 2)

(U. S. PAT. 1813898)



You find that the **CONCAVE SIDES** *fill out* and become perfectly straight. They thus press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the GATES VULCO ROPE—and this means *longer belt life* and *lower belt cost* for you!

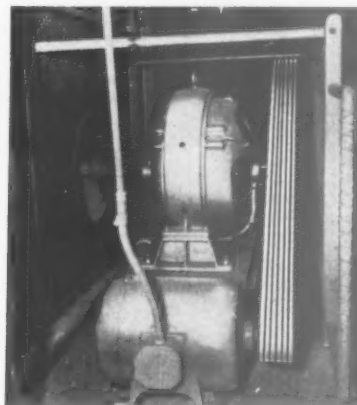
When you buy V-Belts, be sure to get the V-Belt with the **CONCAVE SIDES**—the GATES VULCO ROPE!



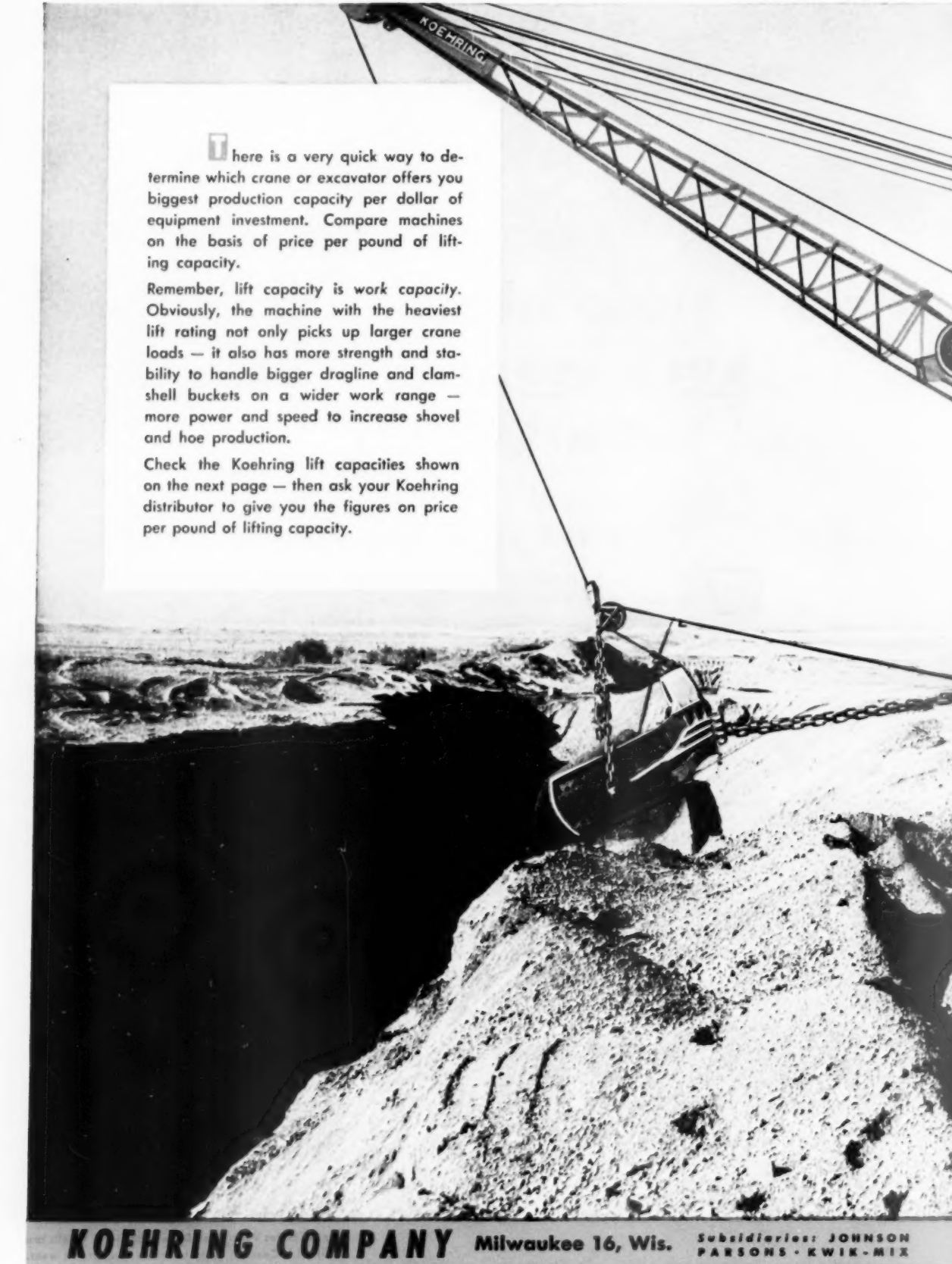
VULCO ROPE DRIVES

THE GATES RUBBER COMPANY
DENVER, U. S. A.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.



Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.



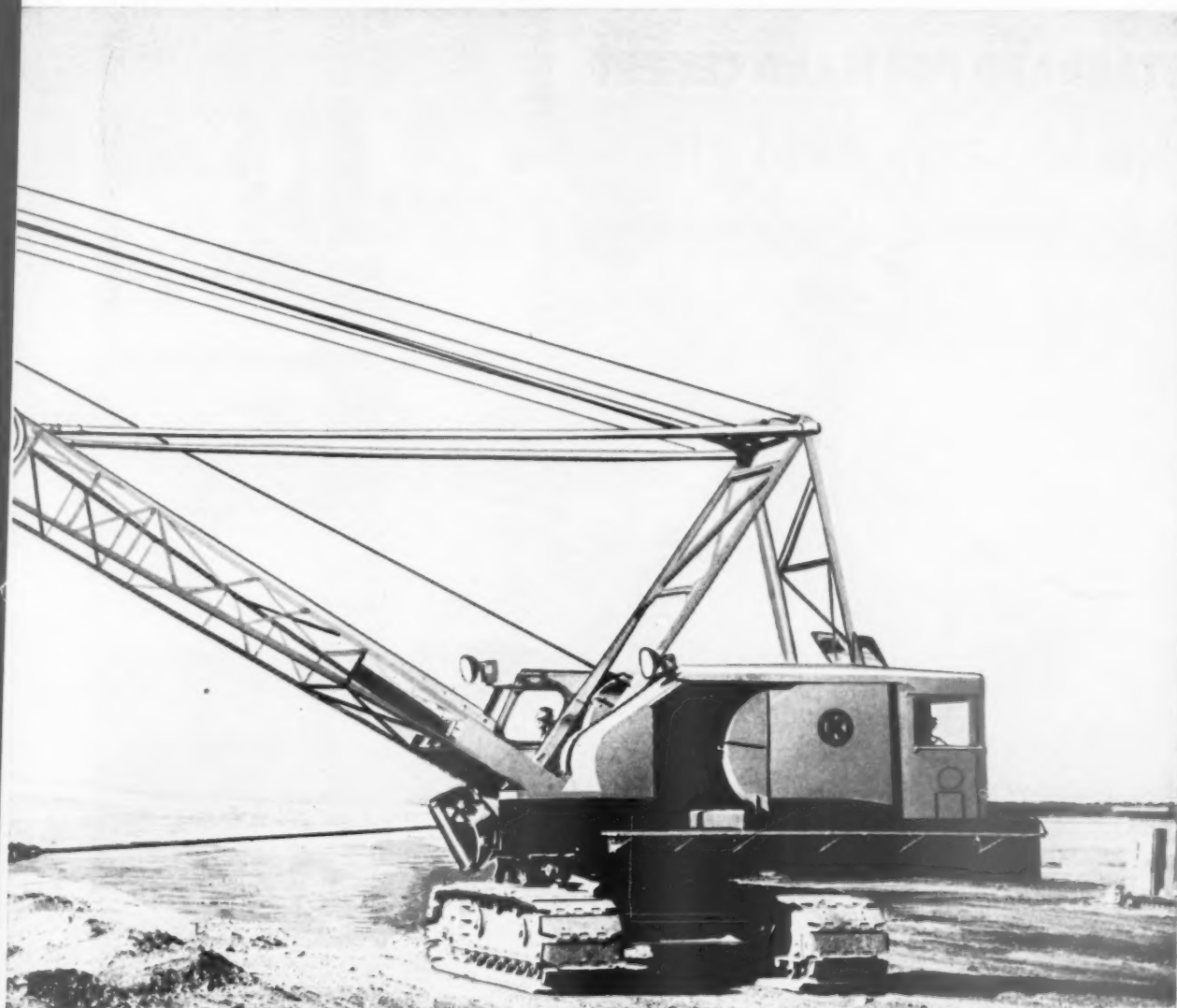
There is a very quick way to determine which crane or excavator offers you biggest production capacity per dollar of equipment investment. Compare machines on the basis of price per pound of lifting capacity.

Remember, lift capacity is work capacity. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength and stability to handle bigger dragline and clamshell buckets on a wider work range — more power and speed to increase shovel and hoe production.

Check the Koehring lift capacities shown on the next page — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.

KOEHRING COMPANY Milwaukee 16, Wis.

Subsidiaries: JOHNSON
PARSONS • KWIK-MIX



Check price
per pound
of lifting
capacity



KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAPACITY*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

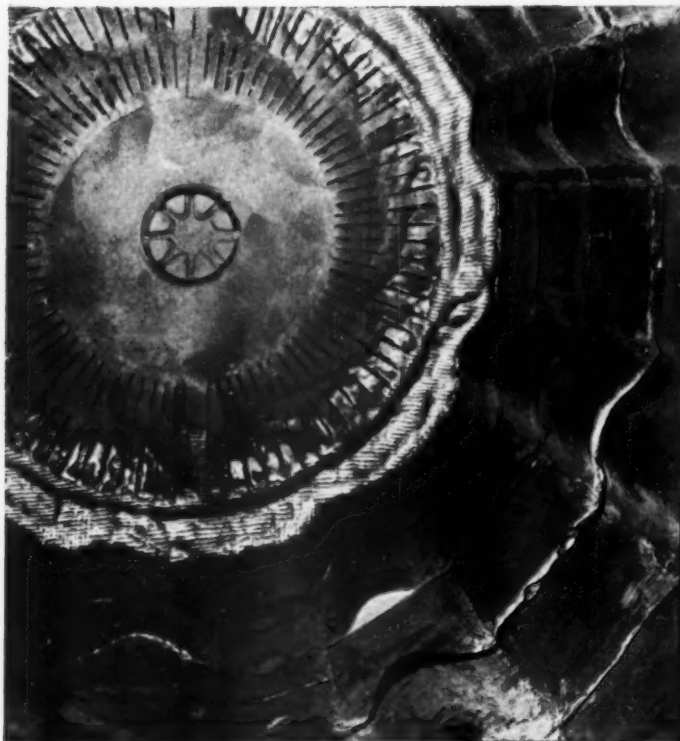
*Figures available on request—ask your Koehring distributor for them.

K430R

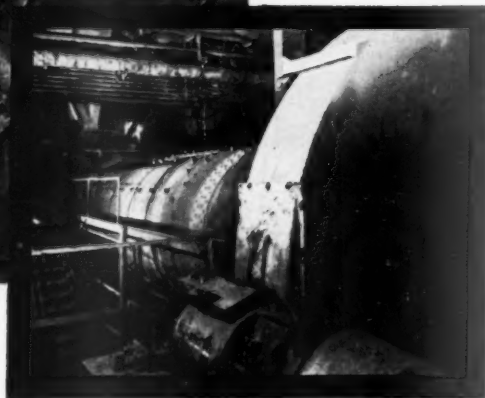
STANDARD PORTLAND CEMENT

increases liner life with

ABK[®]
METAL



Interior of Standard Portland Cement ball mill. Note good condition of liners after 6 years service.



Standard Portland Cement Division, Diamond Alkali Company, Painesville, Ohio, has found that ABK Metal ball mill liners give markedly increased service life. Installed six years ago, these ABK Metal liners have at least 18 months of service left. They replaced liners installed in 1943 that were removed after only five years of relatively light use in low production schedules.

Wherever extreme abrasion is a major problem ABK Metal parts have consistently

proved superior to ordinary "abrasion-resistant" materials. The experience of Standard Portland Cement is typical among firms that require long, uninterrupted operation of equipment handling abrasive materials. Specify these exclusive Brake Shoe nickel-chrome castings with controlled matrix structure and hardness when you want the extra service that means high efficiency production and low maintenance costs. Write today, for complete information.

AMERICAN

Brake Shoe

COMPANY

BRAKE SHOE AND CASTINGS DIVISION

230 Park Avenue, New York 17, N. Y.
109 N. Wabash Avenue, Chicago 2, Illinois

Houston • St. Louis • San Francisco • Toledo

FOR THAT **EXTRA MARGIN** IN SHOVEL PERFORMANCE...



MORE OUTPUT even under the toughest conditions . . . more loads per shift in any quarry or mine . . . extra loads for that **EXTRA MARGIN** in performance . . . that's what you get from this exclusive combination of shovel front-end features:

1. **TWO-SECTION BOOM** provides maximum strength with minimum weight. The lower section is rigidly connected to the A-frame . . . takes the heavy stresses of the digging cycle in stride because it is part of the main machine.
2. **TUBULAR DIPPER HANDLE** is much lighter than equivalent two-member handle, yet equally strong. Its ability to rotate in the rubber-cushioned saddle block eliminates torsion during the digging stroke, minimizes shock loads.
3. **TWIN DUAL HOIST ROPES** assure a steady, positive digging action with automatic shift of hoist power to that part of the dipper lip where it is needed.
4. **INDEPENDENT ROPE CROWD** is simple, positive and quiet. Shipper shaft pinions and handle racking are eliminated. Crowd machinery is located on main deck rather than on boom—swing inertia is reduced, the operating cycle speeded up.
5. **QUICK CONVERTIBILITY** to dragline of the independent motor type. Hoist and drag functions are powered by separate motors, eliminating operating clutches and brakes.

10LS4C

These features—plus many more—make Bucyrus-Eries the finest heavy-duty excavators ever built: yard for yard, dollar for dollar, pound for pound. Write today for complete information on the 4½-yd. 110-B, the 6-yd. 150-B, or the 8-yd. 190-B.



what does

SUPER-TEMPERED

mean to you?

In Super-Tempered Precision Space Screens,
it means just what it says.

- Screens that are made from special super-tempered wire.
- Wire heated red hot and quenched in oil to give it extreme hardness.
- Then tempered in molten lead to secure the toughest structure obtainable.

The result is a combination of qualities
that assures space screens of unrivaled durability.
Let us know your requirements.

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago
Detroit • New Orleans • New York • Philadelphia

SUPER-TEMPERED

PRECISION SPACE SCREENS

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



It takes Six Bolts - not just four

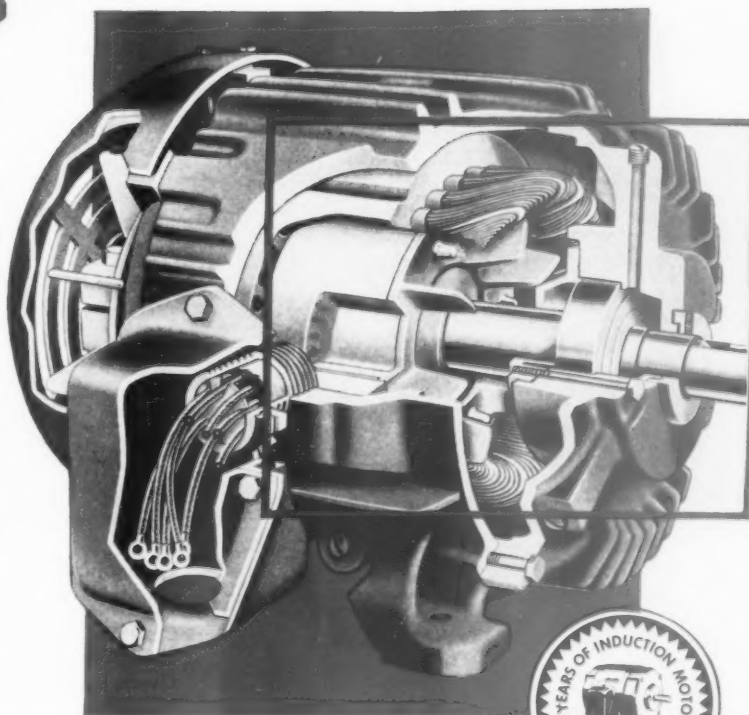


to give full
bearing protection
for greater motor
performance

THE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of *extra* protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

Result? Allis-Chalmers motors pay off in longer, trouble-free bearing life, lower motor maintenance.

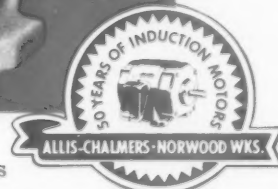


Get all the facts . . . judge for yourself — Compare Allis-Chalmers motors with other motors. Get the six-bolt construction that gives you complete bearing protection. For proof, see your Allis-Chalmers Office or Authorized Distributor, or write — Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS



A-4444



for building Oregon Highways...

NEWPORT CONSTRUCTION CO.

likes
TELSMITH
equipment

48" FC TELSMITH
Gyrasphere Crusher

Two of the three 4' x 12'
TELSMITH Pulsators

Making base rock and oil rock for the Baker Homestake Highway, this plant of the Newport Construction Co. at Baker, Oregon, averages 125-150 yds. hourly. All fine crushing is easily handled by one 48" FC Telsmith Gyrasphere. Two of the plant's three 4' x 12' Telsmith Pulsator screens, trailer-mounted and placed atop a portable bunker, are making finished sizes. The third is used as a scalper. Mr. Marshall Newport says he is "very happy" with Telsmith performance.

Send for Bulletin 266.

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 1, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. 100 West Monroe St. 713 Commercial Trust Bldg. 238 Main Street Booth Egt. Co. The McLean Co. 3825 Lakeside Ave.
New York 17, N. Y. Chicago 2, Ill. Philadelphia 2, Pa. Cambridge 42, Mass. Milwaukee 2, Wis. Cleveland 14, Ohio
Maroon Egt. Co., New Hudson, Mich. • Rish Egt. Co., Cincinnati 14, & Portsmouth, O. • Charleston 22, & Clarkburg, W. Va. • Roanoke 7, & Richmond 10, Va.
Robert B. Bailey, 816 W. 5th St., Los Angeles 17, Calif. • Mines Eng. & Egt. Co., San Francisco 4, Calif. • Clyde Egt. Co., Portland 3, Ore., & Seattle 4, Wash.

Q-28



The muck pile tells the story of Alternate Velocity Loading

If you want the breakage this Pennsylvania quarry got, then try Alternate Velocity Loading with an alternate ROCKMASTER® pattern. This newest ROCKMASTER development has produced improved results in many quarries and it holds possibilities for mining and construction blasting.

In this blast, alternate holes were loaded with low velocity and high velocity charges. The faster millisecond delay caps fired the low velocity holes, putting the rock under maximum stress before shattering. This permitted the sharp punch of the second delay to penetrate further into the burden. The result was better breakage . . . a muck pile that is easy to dig. All holes were initiated from the bottom to prolong confinement of the blast . . . giving maximum results from Alternate Velocity Loading.

For complete details, see your Atlas representative or write to our Technical Division.

BLAST DATA:

Number of holes . . . 11
Average depth . . . 91'
Height of face . . . 85'
Spacing . . . 14'
Burden . . . 27'
ROCKMASTER delays 1 to 6
Total explosives . . . 11,400 lb.
(Apex #2 LV and #4 HV)
Rock produced . . . 34,170 Tons
Powder factor . . . 3
Loading started . . . 7:15 AM
Loading finished . . . 10:15 AM
Blast fired . . . 11:15 AM



ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY,
WILMINGTON 99, DELAWARE

Offices in principal cities



To light Safety Fuse from one point in Secondary Blasting use ENSIGN-BICKFORD

Quarrycord

Now you can use safety fuse and caps in multiple blockhole secondary blasting, with the added features of remote firing.

The lighting device is Quarrycord — a flexible water-resistant cord specially constructed to burn fast, at a speed of about one foot per second, with an external flame at the zone of burning. It is not affected by stray electrical currents, and is ideal for use during the thunderstorm season.

Fuse and caps are prepared in the usual way, with the addition of a connector crimped on the free end of the fuse. This connector protects the fuse powder train during rain storms, and is slotted to provide a firm, positive connection for the Quarrycord.

After the blockholes are loaded, the Quarrycord is run from hole to hole, and inserted into the slot

of each connector. The top of the connector is pressed down over the Quarrycord, locking it firmly in place. The free end of the Quarrycord is then run out to a spot where it can be easily lighted.

Plan your Quarrycord hookup so that the fuse in each blockhole is lighted before the first hole goes. Several groups of boulders can be prepared in this manner, and when all is in readiness, the blaster lights the Quarrycord for each group, and walks to a place of safety.

Q-1

THE ENSIGN-BICKFORD COMPANY
SIMSBURY, CONNECTICUT

Manufacturers of Primacord-Bickford Detonating
Fuse and Safety Fuse

Established 1836

Ensign-Bickford Quarrycord is packed on spools in 500 ft. lengths. See your explosives supplier or write us.

■ ENSIGN-BICKFORD ■

Quarrycord

for lighting Safety Fuse in Secondary Blasting



You can cut grinding costs four ways

with USS Lorain Rolled Plate Linings

1. Less "down-time" for repairs . . .

You get longer, uninterrupted service with USS Lorain Rolled Plate Linings because tight fit between the ends of the plates and between the plates and lift bars eliminates shell wash and allied troubles that eventually cause costly repairs.

2. Less time to install . . .

USS Lorain Rolled Plate Linings are made to accurate size and in easy-to-handle sections that cut labor costs involved in installation.

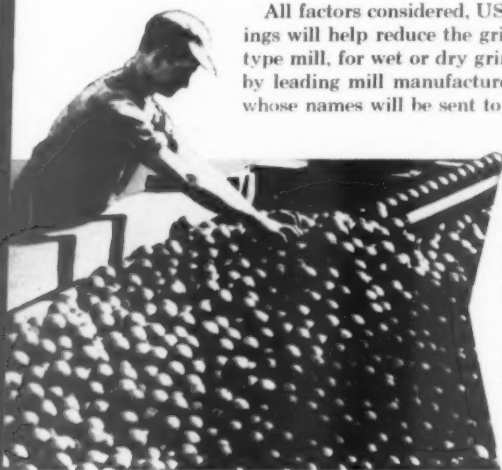
3. More grinding area . . .

Due to the great strength and abrasion-resisting qualities of USS Lorain Rolled Plate Linings, you can safely use thinner plates than would be required with less rugged materials. This permits greater usable diameter . . . increased output for each load.

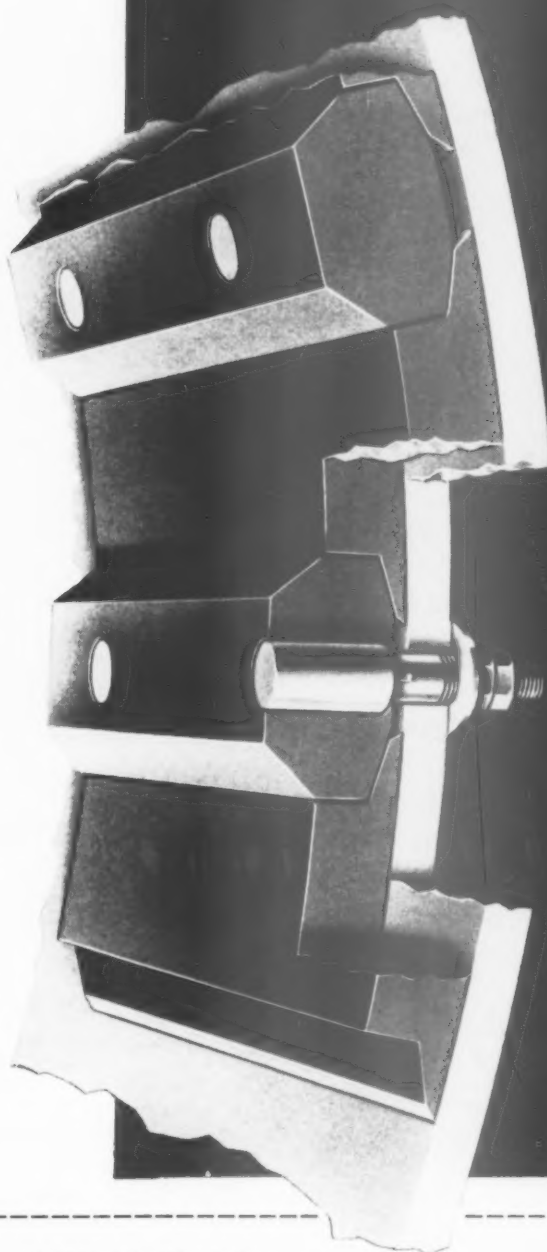
4. Full grinding value from each plate . . .

You get maximum length of service from each USS Lorain Rolled Plate Lining. And severe localized wear at the feed or discharge ends can be easily compensated for by reversing the worn plates at opposite ends.

All factors considered, USS Lorain Rolled Plate Linings will help reduce the grinding costs-per-ton, in any type mill, for wet or dry grinding. They are distributed by leading mill manufacturers throughout the country whose names will be sent to you upon request.



USS Grinding Balls are carefully made of special composition steel to take long, rough wear evenly. Samples from each production lot are thoroughly checked for surface hardness and maximum hardness penetration. They are available in sizes from $\frac{3}{4}$ " to 5". For further information, mail the coupon.



United States Steel Corporation
Room 4527, 525 William Penn Place
Pittsburgh 30, Pa.

Without obligation on my part, please send me your
FREE booklet on USS Grinding Balls.

Name

Company

Address

City State

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS LORAIN ROLLED PLATE LININGS and USS GRINDING BALLS



**Nothing
Succeeds
like
Success**



... Buell 'SF' Electric Precipitators PROVE IT AGAIN!

Spectacular on-the-job performance started engineers talking... and it's been music to our ears ever since.

Our engineering friends have marvelled at low maintenance costs... at brand new efficiency records... at the wide range of different and complex dust recovery problems that are being solved by Buell's 'SF' Electric Precipitators.

We will be happy to demonstrate the finer points at any time. Such standard Buell features as continuous rapping... convenient remote control from a central switchboard... the proved efficiency of the exclusive Buell Spiralectrode, are all elements of simple overall design.

Dozens of Buell 'SF' Electric Precipitators are already operating or in the works. Get the complete facts now. Write for our informative Brochure "The Collection and Recovery of Industrial Dusts" which tells about *all three* Buell Systems of industrial dust recovery. Write today! Buell Engineering Company, Department 17-L, 70 Pine St., New York 5, N. Y.

buell



20 Years of Engineered Efficiency in
DUST RECOVERY SYSTEMS

TELSMITH design and equipment

...meet all deposit and market conditions



TELSMITH Style S
Gyrasphere Crusher

TELSMITH Super-Scrubber
and Vibro-King Screen

TELSMITH Sand Classifier
and Sand Drag

● **Carl Stander**, well known Ohio asphalt man and owner of the Fredericktown Sand & Gravel Co. plant at Fredericktown, Ohio, had many pit and plant problems. TelSmith design and equipment solved them; thanks to an excellent job done by a TelSmith Super-Scrubber and other TelSmith equipment.

This plant produces about 125 to 175 tons per hour—making 4 sizes of gravel and

2 grades of sand at any one time, all meeting Ohio State specifications for asphalt and concrete. In freezing weather, the full crushing capacity of TelSmith Jaw and Gyrasphere Crushers is used to make minus $\frac{3}{4}$ " crusher-run without operating the washing plant.

Here again TelSmith modern design and equipment produce low cost, quality aggregate. Get Bulletin 266.

G-23

TELSMITH Equipment in this Plant

- Two 30"x3'6" Standard Plate Feeders
- 5'x10' Double Deck Scalper Screen
- 4' x 12' Double Deck Vibro-King Screen
- 36 S Gyrasphere Crusher
- 30"x25' Single Screw Sand Classifier
- 72"x10½' Super-Scrubber
- 48"x30' Sand Drag
- Four 45 yd. Steel Bins
- Five TelSmith BG Belt Conveyors, 24" and 18" wide, total length about 525'

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 1, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17, N. Y. 100 West Monroe St. Chicago 3, Ill. 713 Commercial Trust Bldg. Philadelphia 2, Pa. 238 Main Street Cambridge 42, Mass. Boeck Eqt. Co. Milwaukee 3, Wis. The McLean Co., 3525 Lakeside Ave. Cleveland 14, Ohio
Marens Eqt. Co., New Hudson, Mich. Rish Eqt. Co., Cincinnati 14, & Portsmouth, Ohio—Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va.
Robert S. Bailey, 816 W. 5th St., Los Angeles 17, Calif. Mines Eng. & Eqt. Co., San Francisco 4, Calif. Clyde Eqt. Co., Portland 9, Ore., & Seattle 4, Wash.



Yes,
we **DO** mean
to be
Personal

THAT IS, to the extent of giving you the personal recommendations of key men long experienced in adapting Multiwall Shipping Sacks to the exacting needs of a very wide variety of commodities. . . .

of men who realize that thoroughly protective packaging for shipping and storing is a *must* . . .

of men who are capable of making decisions on the spot and upon whose promises of delivery you can depend.

Raymond men are no mere order-takers; they consider your needs from every aspect including sensible economies and clean, sharp, colorful printing for personalizing your package.

May we discuss these matters with you?
THE RAYMOND BAG COMPANY,
Middletown, Ohio. Phone 2-5461

Raymond
**MULTIWALL PAPER
SHIPPING SACKS**

GET TRUCK PAYLOADS!

with the

DEMPSTER DIGGSTER® GRD-101



The two photos above show some very important advantages you get when you use a Dempster-Diggster GRD-101. Photo directly above shows you why you have no truck shock with a Dempster-Diggster. You can lay bucket in truck body, trip latch and pull bucket up off load. Photo at right above shows you why you get a truck payload with a Dempster-Diggster . . . and how natural and easy it is to do so. This truck is now loaded to maximum heaped capacity, yet Dempster-Diggster has ample clearance. The dumping height is 9'6" and the digging height is approximately 15 feet. This enables the Dempster-Diggster to work with high dump equipment.

Other very important features of the new Dempster-Diggster GRD-101 include: AN EXCAVATOR THAT NEEDS NO

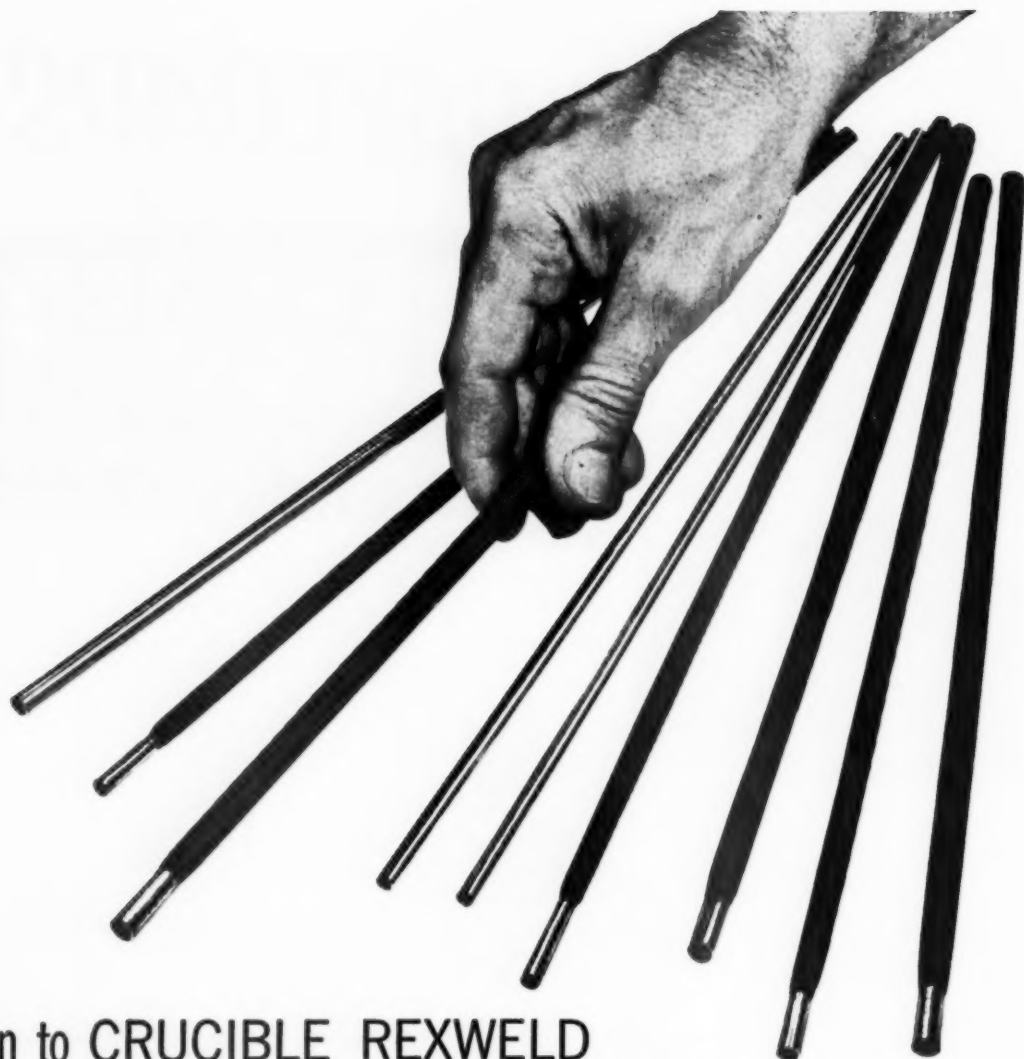


WHEEL TRACTION (loading of bucket is accomplished by the exclusive Hydraulic Crowd and Hoist Action of the Dempster-Diggster) . . . TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING. Here's a shovel

that gives you extra speed on the job and to and from jobs that means extra profits to you! Pound for pound, dollar for dollar, the Dempster-Diggster GRD-101 will out-dig and out-load any other available competing machine in tough going! Let us prove that statement! Write for complete information. Manufactured by Dempster Brothers, Inc.

DEMPSTER BROTHERS

DEMPSTER BROTHERS, 3124 N. Knox, Knoxville 17, Tennessee



turn to **CRUCIBLE REXWELD**
low hydrogen coated electrodes for superior
welding characteristics

Crucible Rexweld low hydrogen coated electrodes provide greater ease of application. Welding can be done efficiently in both vertical and horizontal positions. And you get denser welds — less porosity, when you use Rexweld.

So, to simplify the hard-facing of hardenable steels, extend the life of parts, and cut operating costs, use Rexweld. Your nearest Crucible warehouse has Rexweld low hydrogen coated electrodes, and bare rods, in a wide assortment of sizes and grades to meet all your needs.



CRUCIBLE

first name in special purpose steels

54 years of *Fine* steelmaking

REXWELD HARD SURFACING RODS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.
REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MAX-EL • SPECIAL PURPOSE STEELS



NEW CHEVROLET TRUCKS

**keep going longer,
keep going for less!**

From the day you first put it on the job until the time comes to trade, your Chevrolet truck's going to do more work for you while you spend less to keep it going. Here's why you can count on it—

INCREASED POWER SAVES YOU PLENTY

Chevrolet's high compression ratio (in each of its three great engines) develops more power. That means you go longer before filling the tank! It means, too, you've got extra power handy whenever you need it—for greater acceleration, for an easier pull up steep grades, for steadier going through mud and sand on off-the-road jobs. So, you save not only on operating costs—you save *time* as well.

GREATER RUGGEDNESS PAYS OFF IN LONGER LIFE

Two-ton models, for example, are equipped with heavier axle shafts. All models have newly designed clutches and stronger frames. The best part of it is that, throughout their longer life, you spend less for their upkeep. For complete details about the model you need, see your Chevrolet dealer. He'll tell you whatever you want to know, then give you the best news of all: Chevrolet trucks are priced lower than all other lines! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

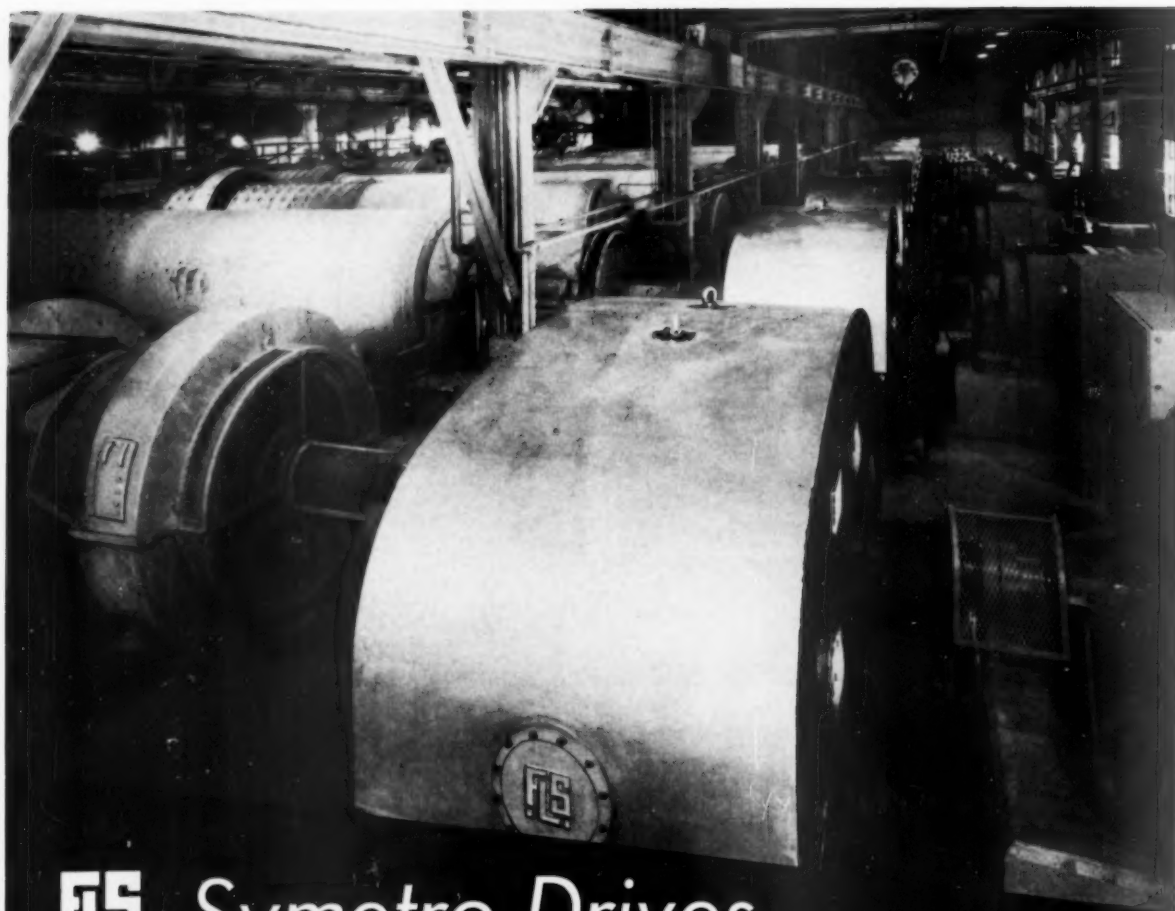
**MOST TRUSTWORTHY TRUCKS
ON ANY JOB!**



CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on 1/2-, 3/4- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates back-rubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

*Optional at extra cost. Ride Control Seat is available on all cabs of 1 1/2- and 2-ton models, standard cabs only in other models. "Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on 1/2-, 3/4- and 1-ton models.

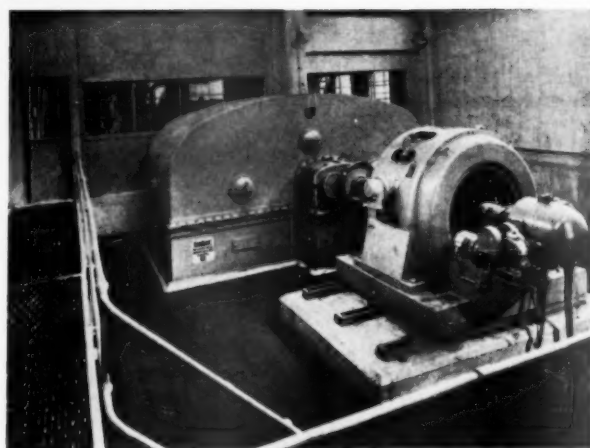


Symetro Drives

Years of continuous, reliable performance at highest efficiency and negligible maintenance.

Over 7500 HP transmitted through Symetro gears direct to trunnions of raw mills in cement plant illustrated above.

Driving station for large clinker mill showing motor and Symetro gear in separate enclosure (right).



For Smidth Machinery apply to:

F. L. Smidth & Co., A/S
Vestergade 33,
Copenhagen K, Denmark

F. L. Smidth & Co.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co., Ltd.,
105, Piccadilly,
London, W. 1, England

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Bombay, India

What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

December, 1954

Two top housing leaders have predicted that home production in 1955 will smash all previous records in a renewal of the postwar housing boom. Norman P. Mason, chief, Federal Housing Administration, expects housing output to reach 1,500,000 units, while Richard G. Hughes, president, National Association of Home Builders, a bit more conservative in his estimate, predicts around 1,400,000 new homes for 1955. The all-time housing record was established in 1950 when 1,396,000 new apartment units and houses were started, and 1954 is expected to go on record as the second best housing year, with over 1,100,000 units in production. The eased home-buying terms in the new housing law passed last summer is credited as being the mainspring for the upsurge in building.

Heavy construction awards, nationally, totalled \$10,253 million for the first 37 weeks of 1954, or 6 percent below the \$10,874 million reported for the same period of 1953, as reported by **Engineering News-Record**. Private construction, with \$5,870 million in awards, was 6 percent below the corresponding period of the previous year. In public construction, state and local contracts totaled \$3,500 million, or only 1 percent under the record high achieved in the 1953 period, while federal contracts, totaling \$883 million, were down 21 percent.

A joint venture to extract potash from sea water is being undertaken by the Norwegians and the Dutch (who have already teamed up to build continental Europe's first atomic pile at Kjeller, Norway). A pilot plant producing 1500 tons of potash has been built near Amsterdam, on Holland's north sea coast. A process reportedly has been perfected which will permit the two countries to produce all the potash they need from the sea water at competitive prices.

Construction contract awards for the 37 states east of the Rockies totaled \$12,660,949,000 for the first eight months of 1954, or 14 percent above the first eight months of 1953, according to an F. W. Dodge Corp. report. Individual eight-month totals, compared with the corresponding period of 1953, were reported as follows: Non-residential, \$4,600,072,000, up 8 percent; residential, \$5,418,867,000, up 23 percent; and heavy engineering, \$2,642,010,000, up 9 percent.

The A.F. of L. Teamsters' Union is lending a Kansas City firm \$500,000 for expansion of its underground storage facilities, which are in an abandoned limestone mine with a constant temperature of 55 deg. F., for storing of commodities ranging from perishable farm products to automobile batteries. Proceeds of the loan will go mainly for additional excavation to increase storage space and to obtain road-building materials.

New construction activity by the railroads was reported at \$262,000,000 for the first eight months of 1954. This compares with \$282,000,000 for the same period of the preceding year.

What is reported to be the purest all-crystalline magnesia refractory for chemical and industrial applications has been developed by Electro Refractories & Abrasives Corp. According to claims, the new refractory is more spall-resistant than the non-crystalline magnesia refractories now widely used and is also less likely to contaminate materials. Wide applications for the new refractory are predicted in the chemical field, including the processing of molten salts and lime and the manufacture of calcium carbide. In the metals industry it is expected to find successful application where resistance to basic slags or metals is a requisite. The lead industry in particular reportedly will find it useful in smelting and purifying operations.

Vast deposits of mineral wealth in the Dead Sea basin are being exploited by the Israeli government in its long-range plan to make the Dead Sea a "living economic stream of life." Potash, salt and bromine are currently being extracted from the basin, with potash production expected to reach 135,000 tons by the end of 1955. The Dead Sea is said to contain "incalculable" mineral wealth. In addition to the minerals mentioned above, it is also said to contain one of the world's largest known deposits of magnesium. Also, within the basin area, indications are said to point to underground oil deposits.

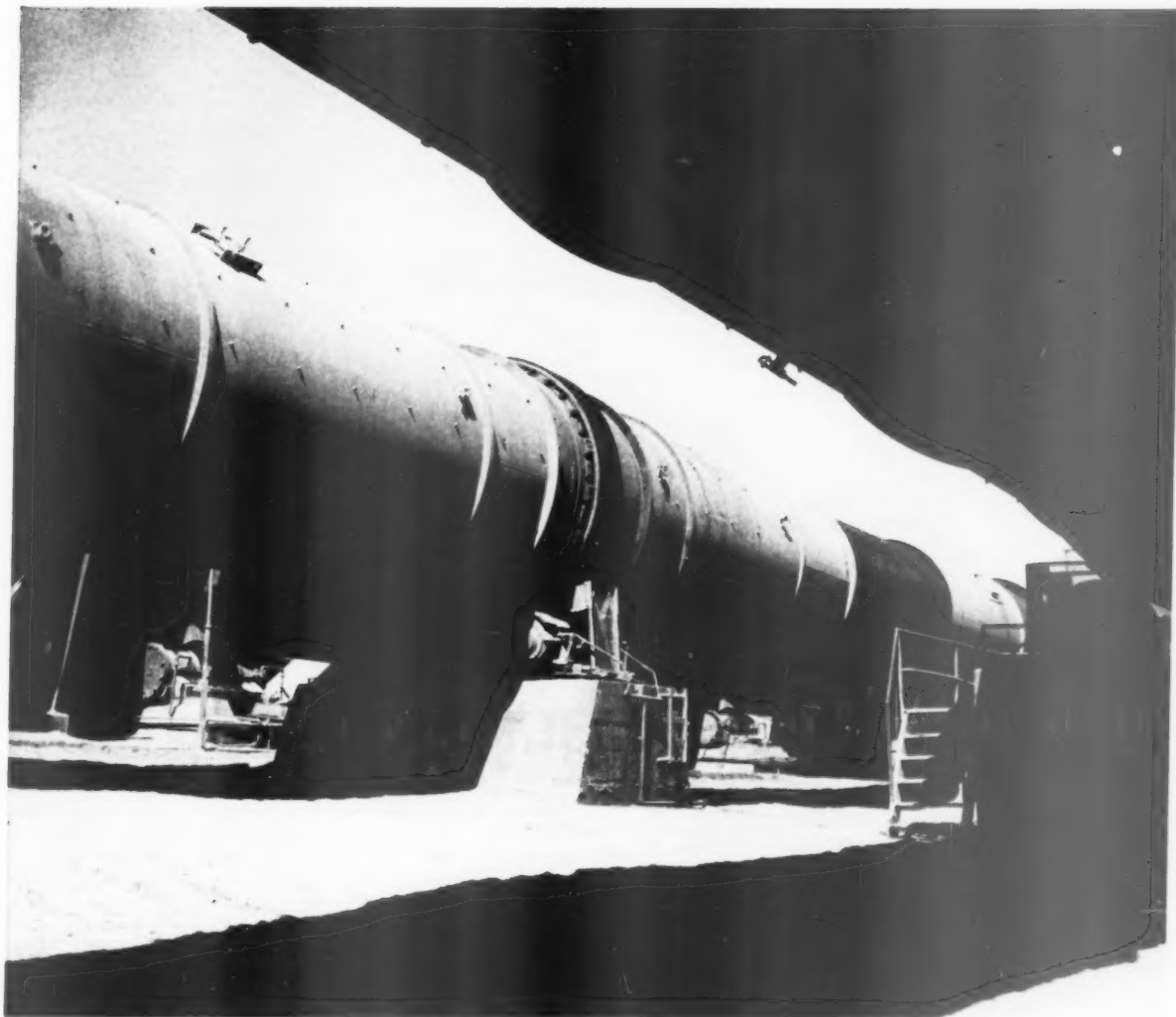
A new and different use for concrete truck mixers was recently reported in *Engineering News-Record*. Empty concrete mixing trucks were used as counterweights to align the center-span box girders of the 1232-ft. long Paseo toll bridge over the Missouri River in Kansas City, said to be the longest self-anchored suspension bridge in the world. A total of 32 trucks with a combined weight of 352 tons were used, half on each of the 308-ft. side spans. They reportedly raised the middle of the 616-ft. center span 5½ in. Jacks corrected the remaining differences in the alignment of bolt holes at the closure.

Construction has been started on Indiana's \$280,000,000, east-west toll road, which will form the final link in a New York-to-Chicago expressway. Special "ground breaking" ceremonies were recently held in St. Joseph County, midway between South Bend and LaPorte, with Gov. George N. Craig turning the first shovel-load of dirt. The 156-mile expressway is scheduled for completion by the end of 1956. Indiana also has another toll road, from Chicago to the Indianapolis area, in the planning stage. This second toll road, as presently proposed, would be about 150 miles long and cost an estimated \$286,000,000.

Sulphite roadbinder reportedly may be the answer for providing low-cost, high-quality runway surfaces for small airports on a limited budget. A small Wisconsin airport first applied the roadbinder to get rid of dust after the airstrip had been regraded. The roadbinder reportedly not only laid the dust, but also bound together the gravel and finer materials into a hard surface which even remained firm enough for use during the spring thaw.

A Miami, Fla., concrete plant was recently the victim of a dynamite explosion. At least six sticks of dynamite were said to have been used in the blast which caused an estimated \$30,000 to \$50,000 worth of damages. No clue or motive for the dynamiting has as yet been uncovered. Owners and investigating police are equally mystified.

THE EDITORS



Permanente brick outlasts other brick 4 to 1

"... average life for the PERMANENTE brick lining was 11 months for the 42' hot zone and 14 to 15 months for most of the lining. During a large part of this time, the kiln operated on a very high silica mix (over 5%). Past performance records show that if 70% alumina brick had been used at least 4 complete linings would have been required."

This report from a leading cement producer is more proof that Permanente Periclase-Chrome Brick gives dramatically superior hot zone service. Let us show you how it can increase *your* clinker production and reduce your costs—as it is doing in kilns all over the country.

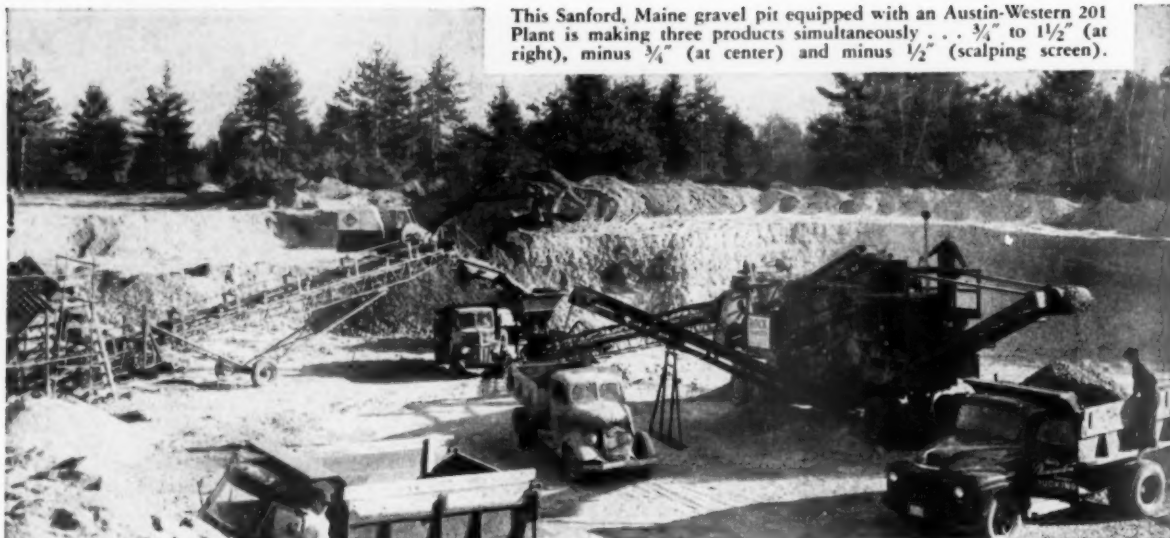
Send now for free 30-page booklet giving installation procedures and advantages of Permanente Periclase-Chrome Brick. Standard brick sizes available, both burned and chemically bonded. Installation service at no extra cost.

Call or write Kaiser Chemicals Division, Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway, OAKLAND 12, California . . . First National Tower, AKRON 8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Bricks and Ramming Materials • Dolomite
Magnesia • Magnesite • Alumina • Periclase



This Sanford, Maine gravel pit equipped with an Austin-Western 201 Plant is making three products simultaneously . . . $\frac{3}{4}$ " to $1\frac{1}{2}$ " (at right), minus $\frac{3}{4}$ " (at center) and minus $\frac{1}{2}$ " (scalping screen).

Across the country **AW** owners agree:
If you **COMPARE** before buying...
you'll choose an **AUSTIN-WESTERN** plant!

You know from experience that there are a lot of differences in crushing and screening plants. That's why you should compare carefully the leading makes of portable plants, looking particularly for the things which are needed for trouble-free operation and low-cost output.

A thorough comparison will convince you that Austin-Western's plant is the one for you. You will like its rugged construction, superior jaw and roll crusher and ready portability.

Here's proof that it will pay *you*, to *compare* crushing and screening plants before you buy. Study the chart in this ad and you'll see how much more you'll get with an Austin-Western crushing and screening plant. Call your A-W distributor or write us right away for further facts. Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Why it will pay you to **COMPARE** before you buy

COMPARE . . .	A-W	Make "X"	Make "Y"	Make "Z"
Welded Steel Plate crusher frame for high strength without weight of cast steel frame	Yes	No	Yes	No
Machined steel toggle plate for absolute protection instead of cast iron	Yes	No	No	No
Inclined positive-throw type vibrating screen	Yes	Yes	No	Yes
Dustproof and watertight brakes on outside of wheels	Yes	No	Yes	No
All bearings of anti-friction type	Yes	Yes	Yes	Yes
Single source for wide range of complete stationary or portable plants, crushers, matching screens, elevators, conveyors and bins	Yes	Yes	No	No
Total	100%	50%	50%	33 $\frac{1}{3}$ %

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

Austin-Western

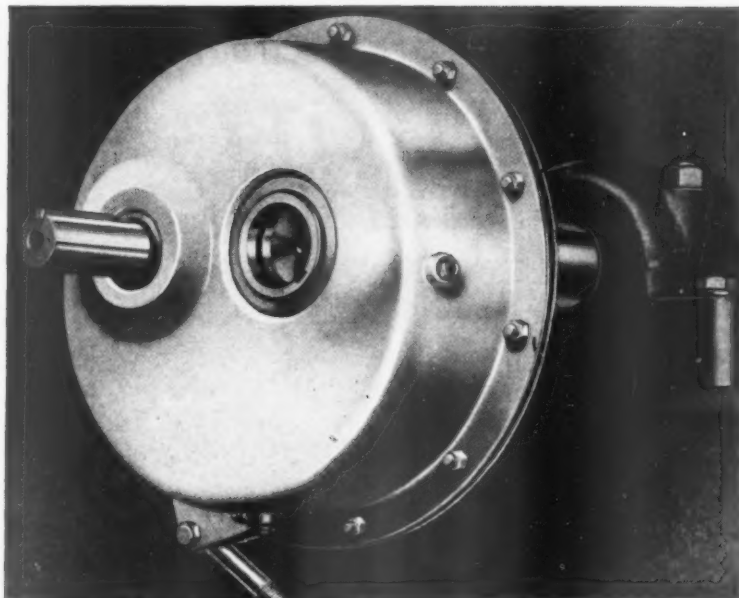
**CRUSHING, SCREENING
and WASHING EQUIPMENT**



Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION

**Construction Equipment Division
LIMA, OHIO, U.S.A.**



FALK ALL-STEEL

Shaft Mounted Drives — *simple-compact-rugged-efficient*

Created specifically for the vast number of applications demanding a sturdy and compact speed-reducing unit for direct mounting on the driven shaft, the new Falk all-steel Shaft Mounted Drive is built to give long service life at substantial savings of space, time, power and maintenance costs!

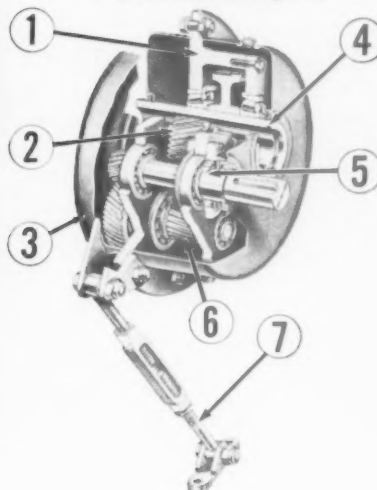
This efficient helical-gear drive, latest in the unmatched list of Falk precision-gearing achievements is an ingenious modification of the time-tested Falk Motoreducer design which has held, for more than 20 years, recognized leadership in this branch of highest-quality power transmission . . . It complements and completes the world-famous Falk line of reduction units covering the entire range of industrial applications.

Investigate the Falk all-steel Shaft Mounted Drive. Write to Department 247 for engineering bulletin, including selection and dimension details.

SIX SIZES

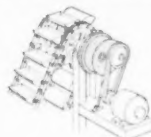
- 1/2 to 30 hp
- Single or double reduction
- Wide output speed range—420 to 10 rpm

These famous FALK
"In-built" factors
mean long life and
dependability...



- 1 All-steel Frame**, with more than double the rigidity of iron, supports all rotating elements.
- 2 Precision Helical Gears**, designed and machined by Falk, rated to AGMA standards.
- 3 Pressed Steel Housings**, whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismantling unit.
- 4 Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.
- 5 Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.
- 6 Positive Lubrication**, continuous direct dip of revolving elements at all speeds.
- 7 Tie Rod** and turnbuckle serve as anchor and facilitate V-belt or chain adjustment.

A FEW TYPICAL APPLICATIONS



BUCKET ELEVATOR



SAND CLASSIFIER



APRON FEEDER



BELT CONVEYOR

THE FALK CORPORATION, Milwaukee 8, Wisconsin

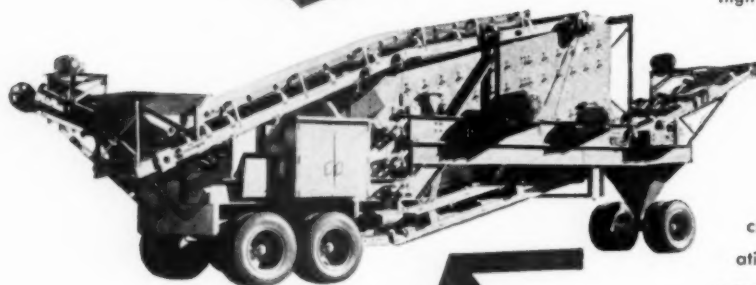
MANUFACTURERS OF

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| • Motoreducers | • High Speed Drives | • Marine Drives |
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FALK

... a good name in industry

UNIVERSAL PORTABLE SCREENING AND BLENDING UNIT INCORPORATES **SIMPLICITY** 5'x14' 3-DECK SCREEN WITH BALL TRAY



Simplicity Gyrating Screens with single, double and triple decks are available in a wide range of sizes for fast, accurate and efficient sizing and separating operations. For complete information, consult a Simplicity sales engineer or write us today.

At the Anderson-Oxandale aggregate plant in Herington, Kansas, they're getting exceptionally high tonnage of good quality aggregate for State road requirements with a Universal crushing plant and portable screening and blending unit. Heart of the screening and blending unit is a Simplicity 5' x 14' 3-deck inclined gyrating screen equipped with a ball tray deck. Handling up to 150 yards of crushed dolomite limestone an hour at this operation, the 70 square foot Simplicity screen produces a specification aggregate consisting of 100% passing 1", 90% passing $\frac{3}{4}$ " and 50 to 60% passing $\frac{1}{4}$ ". Specification of product can be easily varied according to job requirements. To our knowledge this is the largest screen offered in a portable crushing and screening plant.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND, MICHIGAN

- Sales representatives in all parts of the U.S.A.
- For Canada: Canadian Bridge Engineering Company, Ltd., Walkerville, Ontario
- For Export: Brown and Sides, 50 Church Street, New York 7, N. Y.

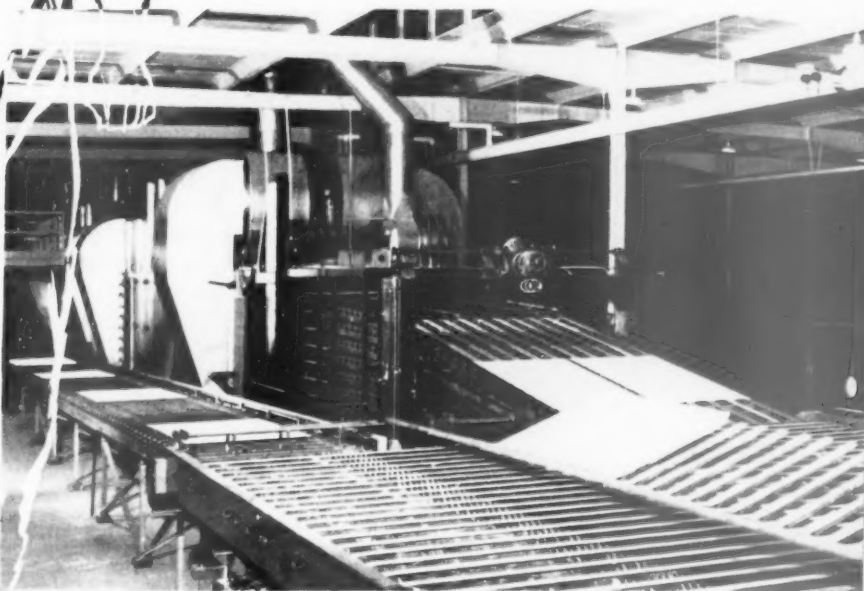
145

COLUMN LEFT

and DOUBLE FILE



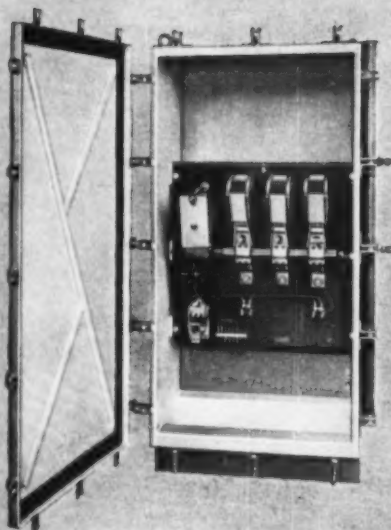
Like marching soldiers, individual pieces of wet gypsum wallboard leave the cut-off, and are automatically paired to move through Kaiser's new 8 deck steam heated **COE DRYER**. Up to 4-1/2 tons of water are removed each hour as the boards proceed through this machine where temperatures of 350° F. prevail. During each 24 hour day this parade of clean dry sheets of quality plasterboard continues on through the bundling operation and thence to contractors throughout the Pacific Northwest. This fully automatic machinery, including the third Coe Dryer purchased, and operated by Kaiser Gypsum, incorporates the latest design features developed in recent years. Each is a milestone of progress for Kaiser, Coe and the growth of the Gypsum Industry, which it has been our privilege to serve for almost 30 years.



THE COE MANUFACTURING COMPANY

PAINESVILLE, OHIO

Established 1852



400-horsepower, 440-volt controller for squirrel-cage motor or primary of wound-rotor motor. Dust-tight enclosure.

SPECIALIZED CONTROL for a ROUGH TOUGH JOB

Custom-Engineered Protection for Motors Driving Crushers

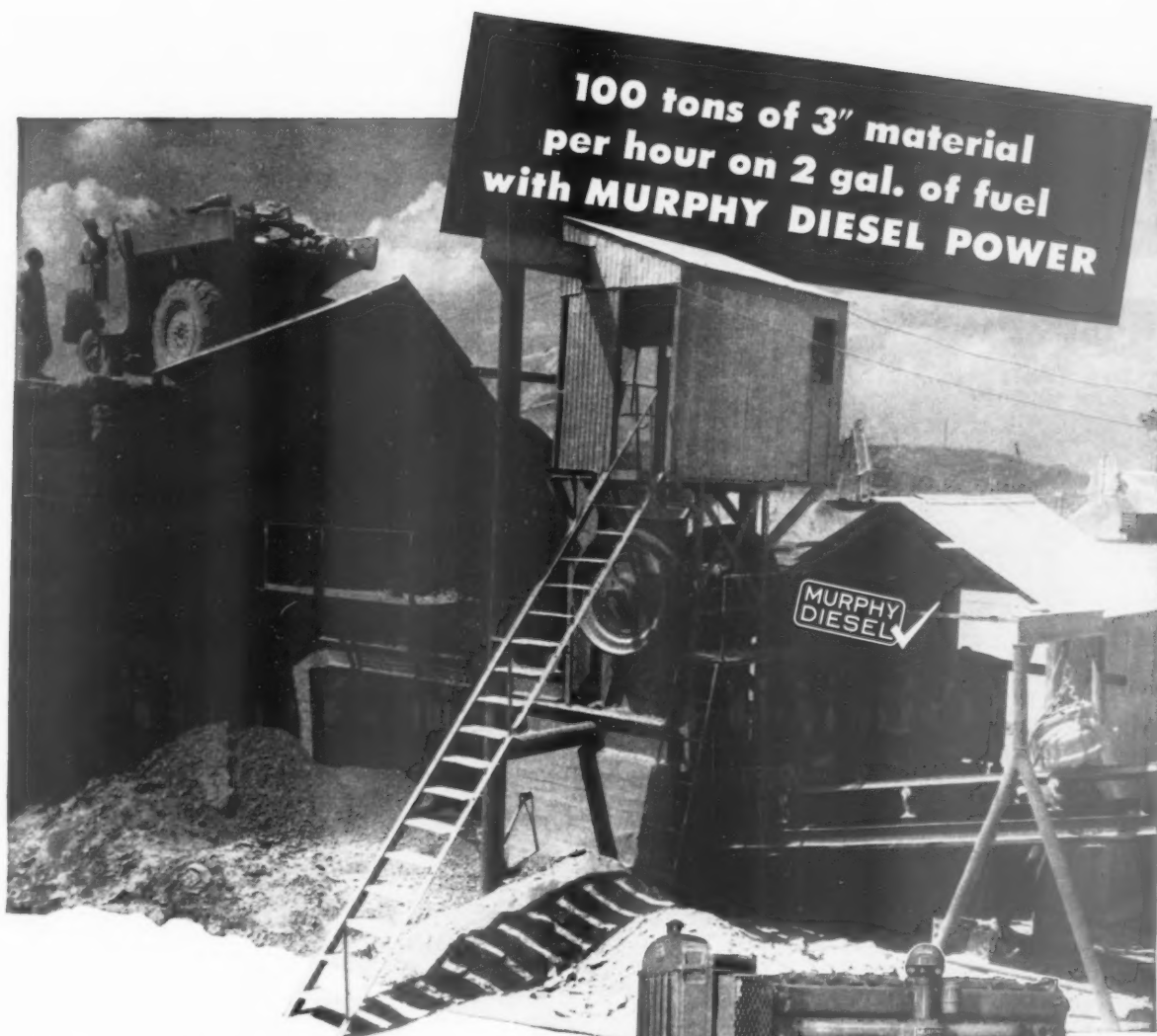
PROTECTING A MOTOR driving an ore or rock crusher is a particularly complex control problem. In crushing, motor burdens (resulting from high inertias or extreme fluctuation of loads) dictate protection far beyond that provided by standard controllers. Only control engineered for your specific job can provide adequate protection.

An Allis-Chalmers control application starts with expert analysis of your problem by an A-C representative. Type of crusher, specific crushing conditions, and cost weighed against lost production are all factors in determining the kind and degree of protection he will specify. All recommendations are backed by complete research and testing facilities . . . by unsurpassed skill and experience in design, manufacture and application. For complete information, call your nearby A-C representative or write for Bulletin C53-424, Allis-Chalmers, Milwaukee 1, Wis.

A-4306

ALLIS-CHALMERS





C. W. CHANDLER, President, Chandler Materials Company, Tulsa, Okla., is another in the growing list of Murphy Diesel owners who has proved the truth of the reports of other rock operators on the operating economy and dependability of Murphy Diesels. Mr. Chandler decided to find out about Murphy Diesels for himself about a year ago. He put a Model 11, rated at 100 H.P., continuous, 110 H.P. intermittent, on his Rogers 20x36 primary at Garnett, Okla. He now reports he is producing 100 tons per hour at a 3" setting and consuming only about two gallons of fuel doing it.

Reports like this come from wherever Murphy Diesels are used to power rock crushers. But there is only one way to find out for yourself—Put a Murphy Diesel on your job. Call your Murphy Diesel Dealer—he'll be glad to give you full information. Or, write direct.

MURPHY DIESEL COMPANY

5315 W. Burnham St., Milwaukee 14, Wisconsin
Dealers in principal centers throughout the nation

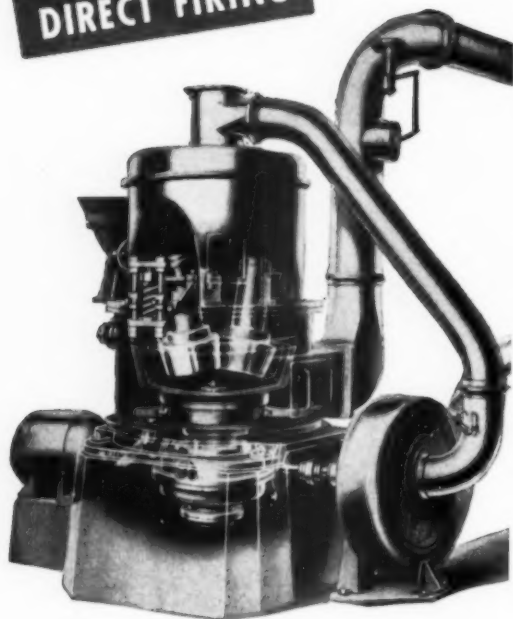
Heavy duty power for rock crushing

Murphy Diesel Engines and Power Units are available in sizes from 90 to 240 H.P. Engine speeds are 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 60 to 154 K.W.

RAYMOND Mills & Separators

FOR FINISH-GROUNDING NON-METALLICS FOR DRYING AND GRINDING SIMULTANEOUSLY

DIRECT FIRING

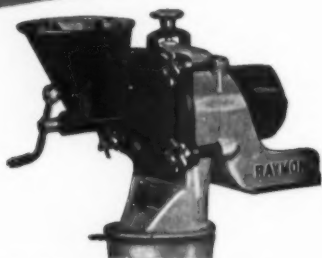


RAYMOND Bowl Mill . . . now in its 20th year of service to industry . . . is today's No. 1 unit for coal pulverizing and direct firing rotary kilns. Over 12 million tons of coal annually (rated capacity) are ground on Raymond Bowl Mills in the lime, cement and dolomite fields alone.

Bowl Mill Firing offers you new economies in plant operation and kiln efficiency. Ease of control, wide range capacity, high availability, ready response to any load changes, low operating and maintenance costs, are some of the many advantages that pay off in extra savings and plant output.

Write for details of this fully coordinated, automatically controlled direct-firing system.

LABORATORY PULVERIZING

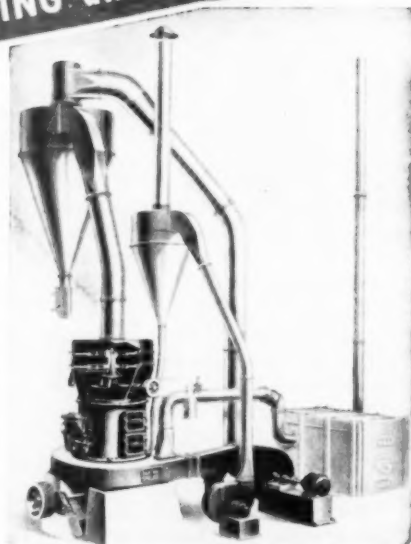


RAYMOND "LAB" Mill is a compact motored unit for handling small capacities in test runs.

RAYMOND Roller Mill equipped with Flash Drying Accessories for removing surface moisture while pulverizing the material.

Highly efficient for handling limestone, gypsum, phosphate rock and similar non-metallics which can be fed direct to the mill without pre-drying.

DRYING and GRINDING



Bulletins
ON REQUEST

COMBUSTION RAYMOND DIVISION

FOR THE FINE GRINDING FIELD

CAPACITIES UP TO 30 TONS OR MORE PER HOUR. FINENESSES UP TO 99.9% PASSING 325 MESH AND FINER

SUPERFINE PULVERIZING



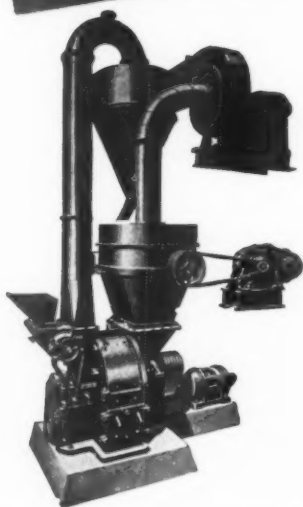
RAYMOND Vertical Mill for producing powdered materials in sub-sieve particle sizes. It operates in a fineness range beyond that of ordinary pulverizers. Many products can be reduced to 95% to 99% finer than 15 to 20 microns. Some softer materials can be ground to 95% to 99% finer than 5 to 10 microns.

WHIZZER SEPARATION



RAYMOND Double Whizzer Mechanical Air Separator for fine classification of mill grind. Also made in Single Whizzer Type . . . and in sizes from 4 to 18 feet diameter, also in small laboratory units.

GRINDING and CLASSIFYING



ENGINEERING SERVICE

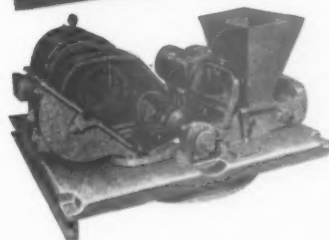
Our sixty-seven years' experience is available to you. Write us about your grinding problem and let us recommend the proper equipment to do your job.

RAYMOND Imp Mill with Whizzer Air Separator for finish grinding operations on a wide range of medium soft dry materials.

An efficient compact unit that handles the material automatically and dustlessly from feed hopper to finish bin.

Simple to operate . . . easy to control product . . . economical to install, operate and maintain.

FINE REDUCTION



RAYMOND Ray-Ducer for handling the softer non-abrasive materials.

ENGINEERING, INC.

1307 North Branch Street, Chicago 22, Illinois

Sales Offices in Principal Cities

make set-ups faster

... spot holes easier — get better fragmentation, faster drilling speeds, lower costs



Use a **Le Roi-CLEVELAND**
T286 Self-Propelled
Dual Drill Rig

It's 2 Le Roi-CLEVELAND patented air feeds and drills
with air-motor booms mounted on a 25-hp tractor
3 speeds forward ... 1 speed reverse

ONE man *drives* the Le Roi-CLEVELAND T286 places you couldn't get to before with a wagon drill.

And he tows the compressor right along.
The T286 drills and cleans holes as deep as 30' — in any direction — at any angle — with less air.
All this means faster set-ups, better hole spacing, greater footage, better fragmentation, lower costs. Have your Le Roi distributor show you. Write for Bulletin RD-21.



One Le Roi Airmaster 600 cfm Compressor provides all the low-cost air you need to operate the T286 Dual Drill Rig, when it is equipped with Le Roi-CLEVELAND 4"-bore drifters. A smaller compressor is sufficient, when the T286 is equipped with the 45-lb. H10 or 80-lb. H23 (3 1/8"-bore) sinker drills or 3 1/2"-bore D25 drifter.

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.
CLEVELAND ROCK DRILL DIVISION

12500 Berea Road, Cleveland 11, Ohio

Plants: Milwaukee, Cleveland and Greenwich, O.



C-144

The Facts Behind Allis-Chalmers Leadership in Torque Converter Tractors

*Fourteen years of experience . . . eight years with production models
. . . thousands of torque converter tractors out in the field . . .
millions of operating hours on every kind of work.*

TODAY'S tractor owners have given their "stamp of approval" to torque converter drive—as a key factor in the new standards of tractor performance they need for today's closely-bid jobs. Here's why —

Automatic Matching of speed and pull to load and terrain conditions . . . more dirt moved every hour, day in and day out.

Hydraulically cushioned protection for engine, clutch, transmission, rear end. The entire tractor lasts longer! That means less downtime, lower maintenance costs, more profit.

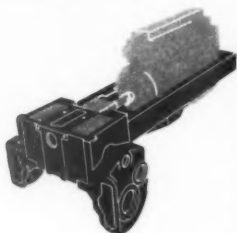
Operators love it! Allis-Chalmers torque converter tractors are so easy to handle (most shifting is eliminated) that operators do a top-notch job all day long.

Yes, the industry's most experienced men are demanding and buying torque converter tractors . . . and in this, Allis-Chalmers leads the way.

But, remember, you don't buy just one feature . . . you buy a tractor, with torque converter drive designed as a matched part of the entire machine. This advanced drive is only *one* of the many outstanding features that have switched so many leading contractors to Allis-Chalmers tractors. So . . .

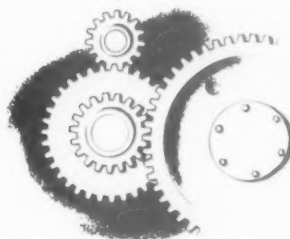
Check all these features before you buy!

All-Steel Box-A Main Frame with one-piece, rear-end housing gives improved weight distribution, soaks up shocks, provides better equipment mounting, greater servicing ease . . . longer equipment life.



Service Simplicity of Unit Construction — Power drive components can be easily removed, repaired or replaced without disturbing adjacent parts . . . saving time and money.

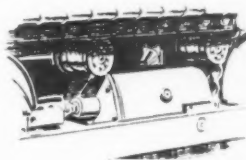
"Live" Sprocket Shafts — "Live" shafts with straddle-mounted bearings permit small, more serviceable seals. Double reduction final drives with smaller gears and shorter, heavier shafts mean extra ground clearance, better alignment, longer life.



1,000-Hour Lubrication — Tapered roller bearings and positive seals on truck wheels, idlers, support rollers and final drives extend lubrication intervals, cut downtime.

Hydraulic Booster Steering — Gives operator small tractor maneuverability with new ease. In addition, self-energizing brakes which take hold with a firm, uniform grip, provide exact control and sure safety with less pedal pressure.

True-Dimension Track provides maximum ground contact . . . plus the right design, the best steels for every job condition . . . heat-treated for long life with the industry's newest, most complete facilities.



Oil-Enclosed Track Release Mechanism — Operates in oil, seals out dirt and moisture, always in working condition to provide positive protection.

See your nearby Allis-Chalmers dealer now for the full story. Whether you're interested in a big tractor like the HD-20 or HD-15 . . . or the smaller HD-9 and HD-5, you can be sure of getting the most advanced tractor in the business, because Allis-Chalmers is the leadership line.

ALLIS-CHALMERS

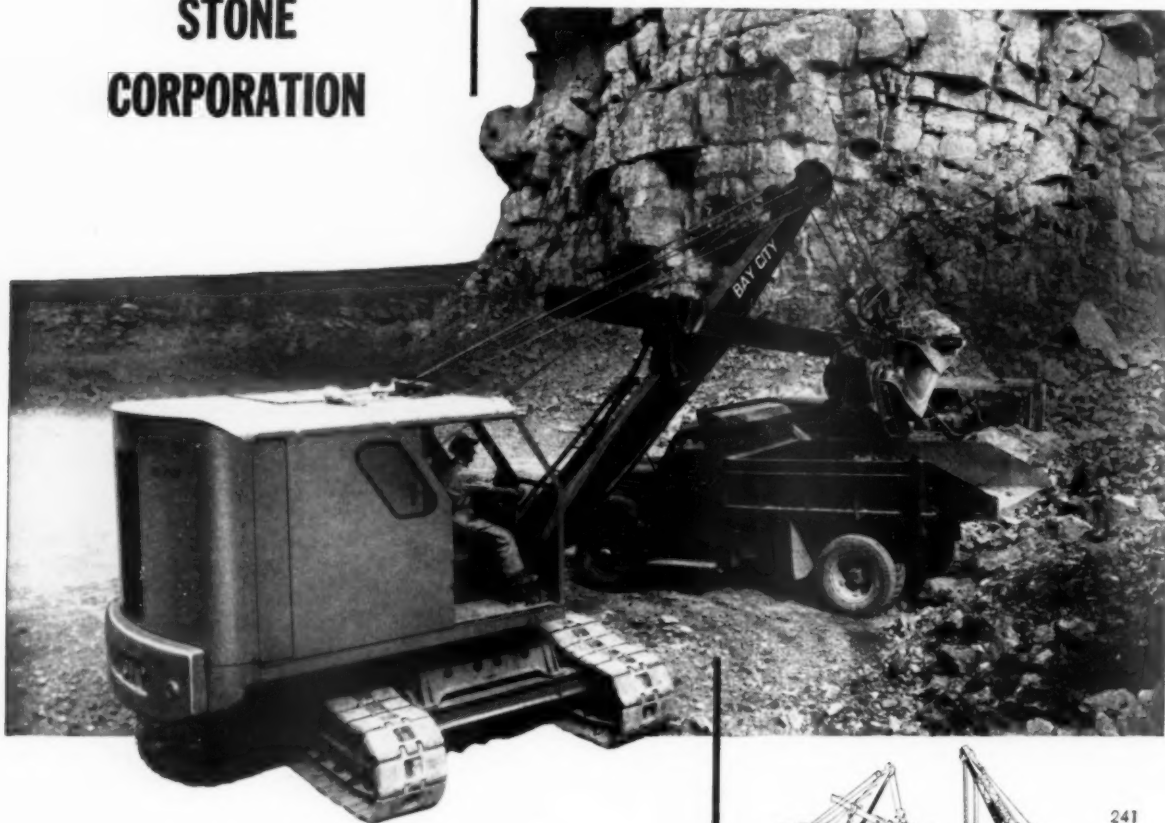
TRACTOR DIVISION • MILWAUKEE 1, U. S. A

BAY CITY
3/4-YARD SHOVEL
handling 800-1000 tons
blasted rock per day
for the
CATSKILL MOUNTAIN
STONE
CORPORATION

"Our BAY CITY Model 45 shovel with 3/4-yard rock type dipper not only averages 800 to 1000 tons of blasted rock per 10-hour day in feeding the crusher, but it also sorts out stones weighing up to 6 tons for secondary blasting," says Mr. W. H. Peckham, President of Catskill Mountain Stone Corporation. BAY CITY doubled the daily production over a former light duty 3/4-yard shovel, proving once again that for heavy duty work there's nothing like the tough, powerful BAY CITY. It has double dipper sticks, 3-part line, a 6-foot rotating path, helical cut gears, separate shafts and bearings for each hoist drum, and it is powered by a big 517 cubic inch Waukesha engine. These specifications compare favorably with many 1-yard shovels. Get complete information on the BAY CITY 45 from your BAY CITY dealer.



Write for these catalogs describing BAY CITY Crawlers of 1/2 yards and up, BAY CITY CraneMobiles and CraneWagons in capacities to 25 tons.



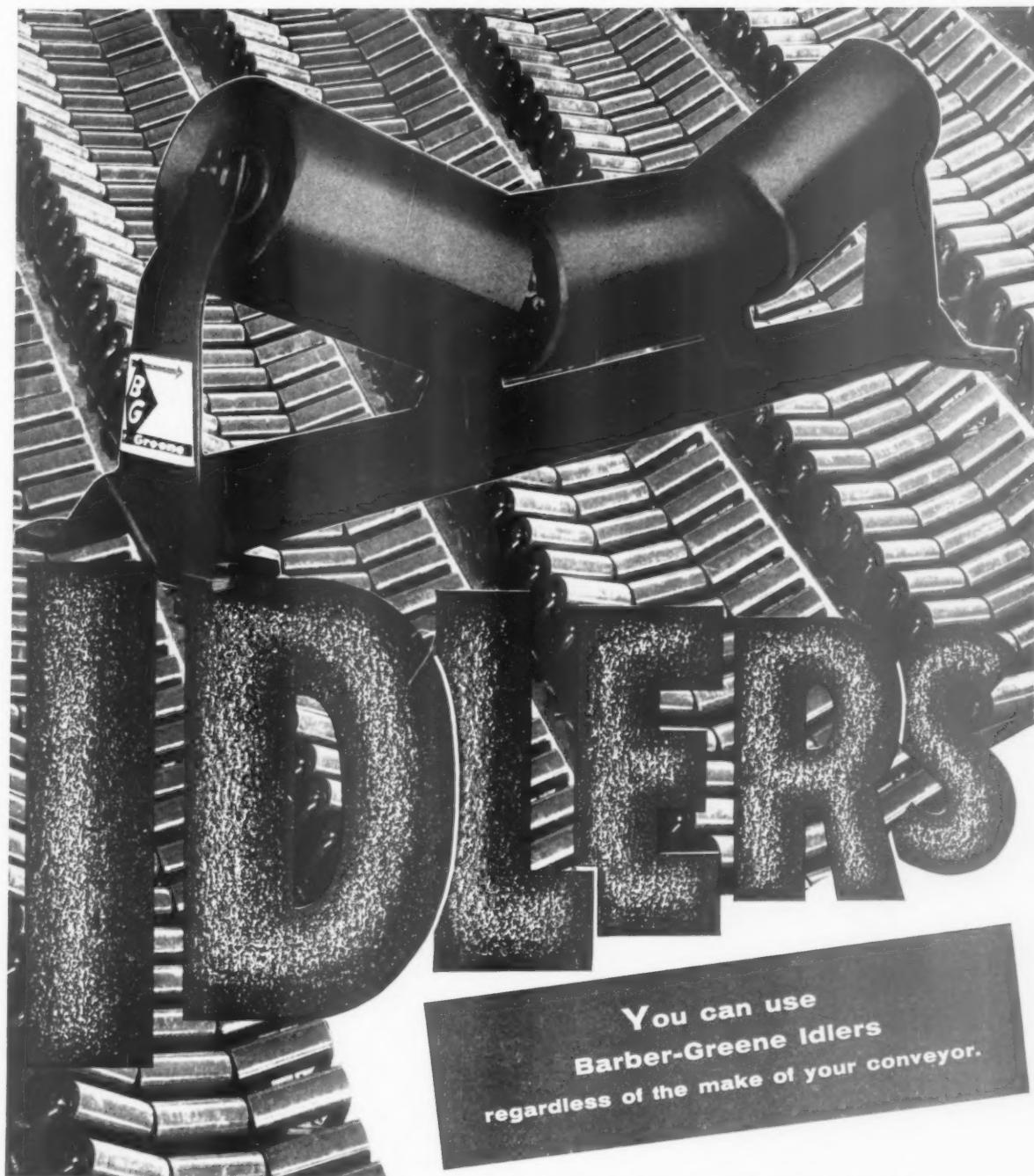
BAY CITY

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



241



You can use
Barber-Greene Idlers
regardless of the make of your conveyor.

Available in all types, in all common sizes. Write for Bulletin 76C.

54-42-PE

Barber-Greene

AURORA, ILLINOIS, U.S.A.

WRITE for
INFORMATION

descriptive  literature ... sound  movies
cost  studies ... nearby  job inspection ... plant  layouts



**TAPER-LOCK SOLID STEEL
CONVEYOR PULLEY**

1

DRUM DESIGN
—maximum strength
—minimum weight

2

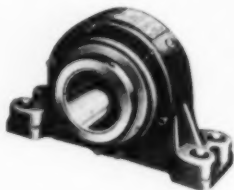
FULLY ENCLOSED
no dust — no dirt — no water

3

SUBMERGED-ARC PROCESS
—full strength in all welds

4

TAPER-LOCK BUSHING
—no walking on shaft
—easy on — easy off!



**DODGE-TIMKEN ALL-STEEL
PILLOW BLOCK**

5

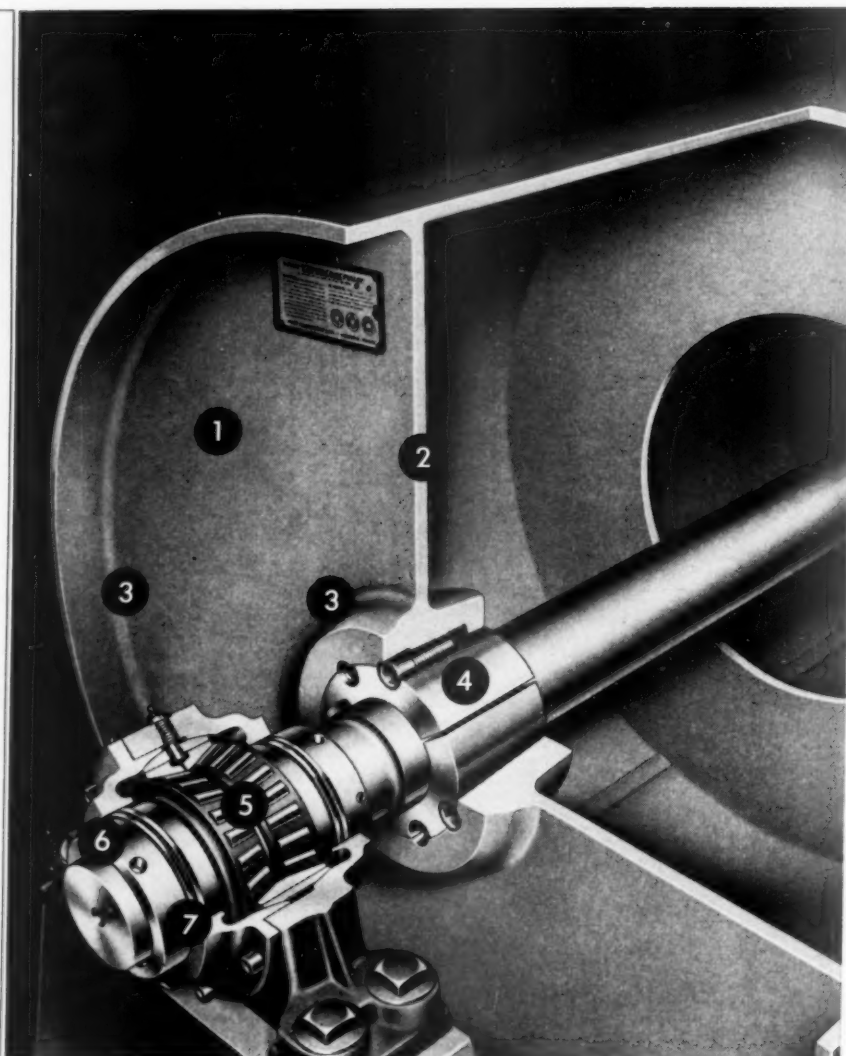
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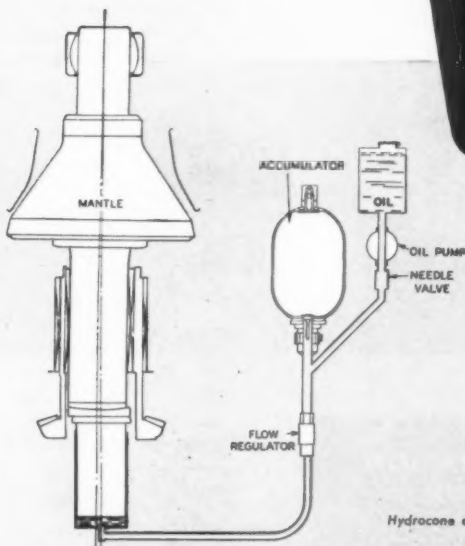
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Simplified Compensation for Wear—Compensating for wear on concaves and mantle is equally as fast and convenient. A push of a button on large *Hydrocone* crushers or a move of the hand control on smaller sizes does the job.

**Fast Emergency Unloading
and Tramp Iron Protection** — If crusher stops abruptly because of power failure or other emergency, *Speed-Set* control facilitates fast clearing of crushing chamber.



How Speed-Set Control Works

Mainshaft assembly is supported on hydraulic jack. Oil pumped into or out of jack raises or lowers crushing mantle.

When tramp iron enters crushing chamber, oil from jack is forced into accumulator, allowing mantle to lower. Automatic reset returns cone to original setting after tramp material is passed.

For complete information, see your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 07B7145B.

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EDITOR'S PAGE

Cooperation With Suppliers As An Approach to Profits

WITH WAGES more or less standardized at a high level, or actually increasing slightly, there is a drive on by many large industrial concerns to reduce costs of their products, that is going beyond the reaches of their own facilities. More and more of the large manufacturers are investigating the costs of the things they buy, and they are getting better prices as a result of working closely with their suppliers.

Whether the process be termed as more scientific purchasing, value analysis or purchasing research, as it has been identified by companies which have set up departments for the purpose, it is a profit making function and one that deserves exploration. It has been stimulated by the squeeze on profits, due to the high levels of wages and taxes, and by the realization that more extra profit can be made from savings in purchases than would result from five or ten times as much gross income from additional sales.

These large companies are making it a practice to sit down with their suppliers to discuss ways and means of getting equipment and supplies at lower costs. It is not a case of demanding price reductions but one of suggesting how the supplier might reduce his costs through pointing out ideas for greater efficiency.

Working With Manufacturers

Producers of rock products and concrete products are faced with the same problem, of seeking every avenue to reduce costs in order that profits may continue. While the present demand upon these industries creates something of a seller's market, and the apparent prospect is for a continuation, nevertheless the capacity of the rock products and concrete products industries is being continually increased by new and better facilities. Hence, the established producers must be on their toes.

In seeking ways to improve their operations, such producers can do more in the way of cooperating with their machinery and equipment suppliers by keeping records of performance and suggesting changes that would make for lower costs, or better performance. Some have followed the practice or are doing it right along, but it could well be a universal practice for the benefit of all.

In the case of the large industrial firms to which we made reference, the movement toward more cooperative effort with suppliers for the purpose of effecting price reductions has gained with the recent shift to more of a buyer's market.

While we still have a strong seller's market in some segments of the rock products industries and the condition likely will continue because of the construction boom, it nevertheless would be gen-

erally desirable, and it seems essential to many producers, that they explore more fully how to reduce costs for machinery, equipment and supplies. The main cost factors in their own plants — labor and taxes — require an extraordinary high ratio of the level of production to peak capacity so as not to be squeezed too hard for profits. There also are producers who can sell everything they produce and still not make profits.

Established producers may already have accompanied all that is practicable in the arrangement of machinery and equipment for the utmost in labor utilization and for economical material handling in older plants, but what about the individual units of equipment and all the supplies and maintenance items that go into production?

That is where the producer stands to gain through close relationship with suppliers. And the supplier also can gain through a closer working knowledge of the producers' problems, which ultimately will benefit the rock products industry.

Cooperation with Purchasers

In seeking ways for reduction in costs, it would seem that producers also could cooperate more closely with purchasers of their products, with the idea of seeking purchasers' suggestions for reducing costs of the products or increasing their quality.

This might be merely a gesture in many cases, but it would make for a better understanding between producer and purchaser and could go a long way toward eliminating impossible specifications. If successful in that, the risk of losing business for failure of compliance with specifications would be removed and there would be many instances of savings in production costs.

Before we leave the subject of the desirability for close cooperation between purchasers (producers) and suppliers, we call attention to the fact that Standard Oil Co. of Indiana is making good use of the business press in its "purchasing development" department.

This department studies trade papers, business papers and other sources for information about price trends, new products, changes in supplier personnel and other pertinent news. This information is condensed and passed on to all buyers in the form of a newsletter.

Everything that producers can do to make their organization and their customers cost conscious would be most helpful.

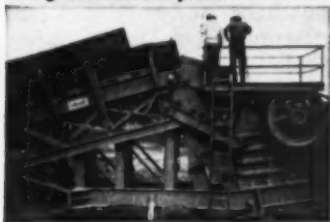
Bron Nordberg

HAVE YOU THOUGHT OF THIS?

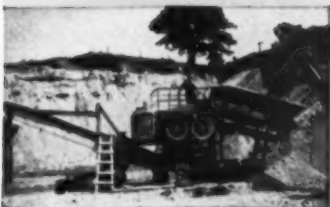


THE **Cedarapids** ANSWER TO EVERY PRIMARY CRUSHING PROBLEM

Whatever your pit or quarry conditions... too much oversize, abrasive gravel or rock, wet or sticky material... there's a size or type of Cedarapids Portable Primary to help you get more profit out of your crushing operations. The plant shown above is a standard Jaw Crusher unit with a vibrating grizzly and can be used ahead of a gravel or rock plant.



VIBRATING GRIZZLY is especially effective where there is a high percentage of fines, or wet, sticky material. Bypassing fines prevents choking of the jaw crusher, reduces wear on the jaws, and increases production of the primary unit up to 25%.



TWIN JAW CRUSHER increases production up to 40% over single jaw primary units. It gives excellent results in conditions where the rock or gravel is highly abrasive.



DOUBLE IMPELLER IMPACT BREAKER assures exceptionally high production of cubical shaped aggregate. Like all types of Cedarapids primary units, it can profitably be used in either portable or stationary applications.

HOW TO:

- Utilize *all* the material...previously rejected oversize, boulders, big quarry rock
- Produce *more* specification aggregate from any pit or quarry
- Get the capacity and flexibility to handle a wider range of contracts

ADD A CEDARAPIDS PORTABLE PRIMARY to your present equipment

● Here's the way to get the jump on competition! Simply add a Cedarapids Portable Primary Crusher to your crushing plant for a set-up *that can't be out-produced* in any pit or quarry, as far as profitable operation is concerned.

With a Cedarapids Portable Primary handling the heavy crushing load, you can turn 100% of pit run material into specification product... re-open old gravel pits considered unworkable due to large boulders or high percentages of oversize. You can produce crushed rock from quarries near the job, if local gravel deposits are exhausted, and reduce hauling costs.

In *any* condition, with a Portable Primary you can crush oversize impossible to crush before and obtain more balanced production and greatly increased output.

Ask your Cedarapids distributor to recommend the size and type of Portable Primary that will turn your most difficult jobs into a high-profit operation.

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Cedar Rapids, Iowa, U. S. A.

An Appreciation of Otho M. Graves

ROCKY'S NOTES

NATHAN C. ROCKWOOD



THE DEATH OF OTHO M. GRAVES ON

October 15 marks the end of an era in the crushed-stone industry. It is unlikely that anyone who follows will ever exert the influence and be the factor that he was in the blossoming of a diffident, even humble, industry into one of recognized national significance. The talents of leadership that were his would have made him a conspicuous success in any professional or business endeavor, and that fate seemed to turn his footsteps toward this industry must always be looked upon as fortunate for the industry, even though in later days a younger element who could not know his background had begun to feel that Otho had overplayed his part.

So, this brief sketch is not an obituary in the ordinary sense. Rather it is an attempt to bring back to the memories of the few contemporaries who survive him, and to make known to the younger generation who never really knew him, the Otho Graves that must go down in the record. So the portrait we show on this page is one as he appeared when he first came into the crushed-stone industry at 36 years of age in 1918. He was "tall, dark and handsome" — the supposed ideal and idol of young women — and certainly he was not unaware of this distinction. He was the only child of a devoted mother; and the bond between him and his mother was the

closest possible as long as she lived. No doubt a psychologist would say that this kind of relationship affected his character much as in the similar case of Franklin Delano Roosevelt; and in some respects their characters appeared much the same. Otho admired Roosevelt in the first few years — as many of us did — because he *did* things, rather than think or talk about them.

Otho came by his self-assurance in other ways than having a brilliant intellect and an adoring mother. In his college days, among other distinctions, he was a champion boxer. Only recently, when I reminded him of an incident connected with his reputation as a boxer, I remarked that this ability must have given him self confidence — the feeling that he could take care of himself in any emergency — and he admitted that it had, but that he had never had occasion to use this talent in any other way than in sport. To the last he enjoyed watching boxing matches — on television too — to note in many instances the lack of science employed. Otho was also fully aware of his talents as an orator and pleader; when I once remarked that he apparently had missed his calling, that he could have been a great trial lawyer, he wondered if it was too late to pursue that course!

Entrance to Industry

Otho was a professor at Lafayette College in Easton, Penn., when he became acquainted with the late John Rice, Sr., president of the General Crushed Stone Co. That he was a competent instructor is attested by the facts that he was author of several text books, and that among his students at the University of Pennsylvania was Alex. Foster, Jr., now vice-president of the Warner Co., Philadelphia, and at Lafayette College, J. F. Magee, now president of the Alpha Portland Cement Co. There are probably many others prominent in these industries we do not know of. His experience as an instructor doubtless helped develop his ability to think and talk effectually on his feet; and he had some political experience as a stump speaker for Teddy Roosevelt in the Bull Moose party campaign. He was one of very few extemporaneous speakers in our experience whose talks read as well as they sounded.

Otho's introduction to the National Crushed Stone Association was as a guest of John Rice at the second convention, held in Buffalo in January or February of 1919. At that convention only, was he inconspicuous and practically unnoticed — as befitted the circumstances. At the convention in Louisville, Ky., the following year he was very much in evidence, and everyone began to recognize his talents as an extemporaneous speaker. It was about this time he was made chairman of the membership committee. His progress was rapid for there was no gainsaying the quality of his leadership. At the 1925 convention in Cincinnati, Otho was elected president.

It was a rather sorry, even though ambitious and enthusiastic organization, that Otho took over. There was not money enough in the treasury to pay a decent salary to a part-time secretary or manager, and the established rate of dues provided no prospect that there ever would be. There was optimistic talk at the convention about establishing a research bureau for crushed stone uses, but the hard-headed oldtimers decided that while the idea was fine it was out of the question for some time to come. Although they knew they had elected a young and aggressive president, they did not begin to realize what was in store for them.

Immediately Otho began to make his plans for the association to materialize. He had first to find the finances, which he did by selling his plans to a select group of substantial producers, who agreed to underwrite the scheme, pending establishment and collection of adequate membership dues. He then had to acquire the necessary personnel to staff the association. A. T. Goldbeck, senior testing engineer, Bureau of Public Roads, he had known at the University of Pennsylvania. Probably Mr. Goldbeck was influenced to leave his good position more by his faith in Otho than any knowledge of, or confidence in, the National Crushed Stone Association. Otho never did things by halves. The crushed-stone industry needed prestige with the users of its products. Reg. Boyd, also with the Bureau of Public Roads, was persuaded to come at the same time as secretary. This happened in the fall of 1925.

(Continued on page 119)

A. P. GREEN Plastic and Castable Refractories

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A. P. Green offers a complete line of refractory products for the cement and lime industry. Whatever your requirement, for specific recommendations without obligation, contact your local A. P. Green distributor... he's listed in the yellow pages of your telephone directory.

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DISTRIBUTORS IN THE PRINCIPAL CITIES OF THE WORLD

LABOR RELATIONS TRENDS

By NATHAN C. ROCKWOOD

Bonus Payments That Are Not Part of Regular Pay Rate

THERE HAS BEEN considerable confusion in regard to the status of year-end or Christmas bonuses paid by employers to employees who have done their jobs well and are entitled to some form of profit sharing. Because in numerous instances such extra payment has backfired on the employer by being considered part of the hourly wage prorated throughout the year in figuring overtime rates, many employers who are inclined to reward deserving employees have held off doing so. We now have a U. S. District Court decision in a case which we believe is very similar to those of many of our readers, although the employer was in an entirely different line of business. The case in point is *Mitchell, etc. v. Black Hills Merchantile Co.*, No. 471 decided September 15 by the U. S. District Court, District of South Dakota. The action was brought by the U. S. Secretary of Labor petitioning for an injunction against the employer for alleged violation of the Fair Labor Standards Act. The injunction was denied.

The full text of Judge Mickelson's decision follows:

"Plaintiff brings this action to enjoin defendant from violating the provisions of Sections 15 (a) (1), 15 (a) (2) and 15 (a) (5), of the Fair Labor Standards Act of 1938, U. S. C. Title 29, Sec. 201 et seq., as amended by the Fair Labor Standards Amendment of 1949.

"The defendant is a small wholesale grocery company operating at Deadwood, South Dakota, which started in 1919 with two employees and presently employs twenty-one people.

"While the evidence discloses some minor violations of the Fair Labor Standards Act, particularly in the early years after the act became effective, such violations were of an exceedingly minor nature and the Court is satisfied that they were committed through ignorance and not as intentional violations.

"As announced by the Court at the close of the evidence the only point upon which the Court was in doubt as to whether or not the injunction asked by plaintiff should be granted was whether or not the bonuses or gratuities paid by the defendant to certain of its employees would constitute a part of the 'regular rate' of pay and which should be considered in computing overtime.

"Counsel have furnished exhaustive briefs and the court has considered these briefs and the authorities cited very carefully. None of the cases cited involve facts too similar to the facts in this case. The case in which the facts most clearly compare to the facts in the instant case is the case of *Walling v. Frank Adam Electric Co.* (1947) 163 F.2d 277. In that case Chief Judge Gardner in the opinion affirming the decision of the District Court of the United States for the Eastern District of Missouri distinguishes the facts in that case from the facts in the cases relied upon by the Secretary of Labor and which are the same cases, for the most part, cited by the plaintiff in the instant case.

Bonuses Not Regular Pay

"In the present case the defendant has, in fact, paid bonuses or gratuities to certain of its employees and in varying amounts almost from the time of its organization, with the exception that during the depression years no bonuses were paid. The fact that bonuses were paid long before the enactment of the Fair Labor Standards Act clearly indicates no disposition on the part of the defendant to circumvent the Act. It is also significant to note that the first time that plaintiff took the position regarding such bonuses as is here made was in the year 1952, and that plaintiff's investigators had on several occasions inspected and investigated defendant's operations for the purpose of determining whether it was complying with the provisions of the Fair Labor Standards Act.

"These bonuses were declared and paid annually to certain of the employees by action of the board of directors near the end of the year or during the forepart of the following year in which the employees' services had been rendered; there was no contract or agreement at the time of the employment, nor at any other time, between the employer and employee for the payment of any bonus; there is nothing in the record to show that such bonuses were declared and paid based upon any formula or as any incentive to greater efforts on the part of the employees. All of the employees who were called as witnesses testified that never, at any time, was the matter of a bonus mentioned as any part of their contract of employment; that they worked for the defendant for the

hourly wage or salary agreed upon; that they were satisfied with such wages or salary and that whether or not they received a bonus in no manner affected their employment or their efforts in their work. There is nothing in the record to show that the wages and salaries paid by the defendant to its employees did not compare favorably with wages and salaries paid for similar employment in this area.

"These bonuses were paid, under the undisputed evidence, solely at the discretion of the employer; the amount, if any, was determined by the employer; the employee had no contract right, express or implied, to any amount; they were nothing more than a sharing of the profits by this small, home-owned wholesale grocery company, operating in this small community where the stockholders, officers and employees were all friends and neighbors. Counsel for plaintiff claim that because these bonuses or gratuities were, in fact, paid with some regularity each year that this amounted to an implied contract that such bonuses would be paid. There is absolutely no evidence in this case to sustain such a view. In fact, the evidence is undisputed to the contrary.

"Considerable reliance is placed by plaintiff's counsel in their brief upon the fact that the bonuses paid were, in certain instances, in a substantial amount and amounted to a high percentage of their regular base pay. The Court has found no authority, and none has been cited, where the amount of the bonuses or gratuities paid was considered in determining whether or not they should be included as part of the 'regular rate' under the Fair Labor Standards Act.

"In the instant case the parties had agreed upon the basic wages and there was never any contract, agreement, plan or arrangement for the payment of a bonus; it was not held out as an inducement or incentive, but as has been pointed out, it was voted by the board of directors and paid after and when the period covered had wholly expired in most instances, and in all others had substantially done so.

"The facts in this case distinguish it from any of the cases relied upon by plaintiff and brings it more nearly within the decision in the case of *Walling v. Frank Adam Electric Co.*, supra. No costs will be taxed against plaintiff."



Thermoid Conveyor Belting cuts handling costs in quarries

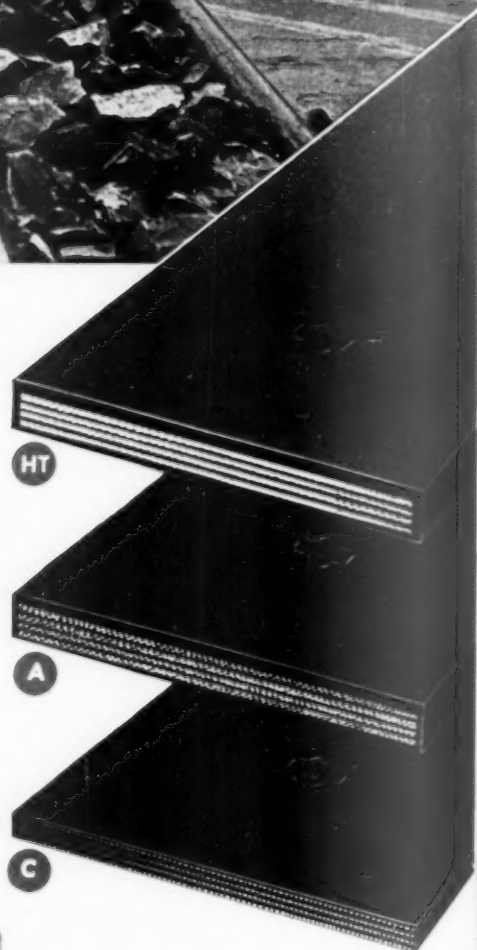


There's a Thermoid Conveyor Belt designed to lower your handling costs on every quarry job. Here are three examples: **HT** For extremely

abrasive materials such as granite, trap rock, flint rock, quartz ore;

A For slag, lime rock, crushed stone and other highly abrasive materials; **C** For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life . . . lower your handling costs per ton. There is a complete line of Thermoid Conveyor Belting, Hose and Multi-V Belts for every quarrying application. Call your Thermoid Distributor for information, or write direct.



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PEOPLE IN THE NEWS

Riverside Appointments

HOWARD R. STARKE, director of engineering, has been named vice-president and technical director of the Riverside Cement Co., Los Angeles, Calif. Herbert E. Bouer, director of personnel and safety, has been appointed vice-president in charge of personnel, and John M. Kinard, formerly assistant to the president, has been made general manager. William G. Henshaw III, grandson of the founder of Riverside Cement Co., and vice-president and director of the Henshaw Investment Co., has been elected a member of the board of directors.

Mr. Starke, a graduate of California Institute of Technology, Pasadena, Calif., with degrees in engineering, joined the research department in 1927 where he remained for ten years and then transferred to the operating department. In 1941 he was appointed superintendent of the Crestmore plant, succeeding the late Earl MacDonald. Five years later, when the company rebuilt the Oro Grande plant, Mr. Starke was placed in charge of the engineering department and had complete charge of designing and engineering the new division. In 1951 he was named director of engineering. At present he is supervising the building of a \$4,000,000 waste heat power plant at Oro Grande.

Mr. Bouer joined the company at Crestmore in 1924, serving as shipping clerk, statistician and assistant packing house foreman. In 1936 he was transferred to the Los Angeles office in charge of the shipping department, remaining there until 1941 when he returned to Crestmore as personnel manager, which position he held until his present appointment. A native of North Dakota, Mr. Bouer attended North Dakota State College for three and one-half years, followed by a year in college at Milwaukee, Wis., where he studied electrical engineering.

Mr. Kinard joined the company in 1950 as an economist, later becoming assistant to the president. He was graduated from Occidental College, Los Angeles, Calif., in 1939, and served as an engineer for a shipbuilding concern at Terminal Island until he entered the armed services in World War II. After his discharge he became associated with a radio and television firm in Santa Monica, Calif., leaving there to enter Harvard School of Busi-

ness Administration for two years, graduating in 1948. Two years later he joined Riverside Cement Co.

Officers Named by Engineering Society

JOSEPH B. GILLENWATER, maintenance superintendent at the Martinsburg, W. Va., plant of the Standard Lime and Stone Co., Baltimore, Md., was elected president of the George Washington chapter of the West Virginia Society of Professional Engineers at its first organizational meeting recently held in Martinsburg. Russell H. Druschel, plant engineer at the Millville, W. Va., plant of the Michigan Limestone Division of U. S. Steel Corp., was elected vice-president. Herbert E. Dux, chief engineer at the Berkeley Springs, W. Va., plant of Pennsylvania Glass Sand Co., Lewistown, Penn., was named state director. James W. Offutt, Berkeley Springs, engineer for Pennsylvania Glass Sand Co., and Howard W. Gibbs, manager of the Millville plant of Michigan Limestone Division, were elected members of the board of directors.

Manager for 30 Years

CHARLES DELLING, manager of the concrete products plant of Puyallup Shope Brick Co., Puyallup, Wash., was given a surprise dinner recently by stockholders and directors of the company who had assembled to celebrate his 30th year as manager of the plant. Vern Ellerding, son of one of the founders, was master of ceremonies.



Charles Delling, right, L. D. Wylls, president, and Vern Ellerding, son of one of the founders of Puyallup Shope Brick Co.

and presented Mr. Delling with an engraved watch to commemorate his 30th anniversary. L. D. Wylls, president, gave a short history of the company, stating that the Puyallup Shope Brick Co. was founded in 1920 and has made continuous progress over the years, especially since Mr. Delling became manager of the plant. Originally incorporated for producing concrete brick, the firm has branched out to include the manufacture of concrete drain tile, culvert tile, building block and other concrete products.

Receives Award

DR. HERBERT INSLEY, who retired in 1953 as chief of the mineral products division of the National Bureau of Standards, Washington, D. C., was recently awarded the Gold Medal for Exceptional Service by the Department of Commerce for "outstanding achievement in the field of petrography and microscopy as applied to glass and to hydraulic cements.

Assists Vice-President

G. B. HALLOWELL, JR., formerly district manager of the Lake Shore district of United States Gypsum Co., Chicago, Ill., has been appointed assistant to H. F. Sadler, vice-president in charge of sales. He succeeds A. B. Cook, who has been named sales manager of the plastering materials division. F. B. Benton, formerly assistant district manager of the Dallas district, has been named to replace Mr. Hallowell as Lake Shore district manager.

Lehigh Plant Managers

PHILIP E. CARLSON, formerly plant manager at the Birmingham, Ala., plant of Lehigh Portland Cement Co., Allentown, Penn., has been transferred to Allentown to assist in the operating department. He will be succeeded by William J. Klein, formerly assistant plant manager at Bunnell, Fla. Fred G. Haigh has been appointed plant engineer at Bunnell, and Edgar G. Gaston has been named plant engineer at Birmingham. Robert C. Jondal, formerly plant engineer at Oglesby, Ill., becomes plant engineer at Union Bridge, Md.

Mr. Carlson joined Lehigh in 1946 as a chemical engineer and, on completing the training course in process control, was assigned to the Buffalo plant as plant engineer and supervising chemist. He was appointed plant manager at Birmingham in 1951. A graduate in chemical engineering from the University of Minnesota, Minneapolis, Minn., Mr. Carlson served in the U. S. Navy during World War II.

Mr. Klein became associated with Lehigh as a chemical engineer after several years in the oil industry. After completing the training course in process control, he was assigned to the Fordwick, Va., plant as plant engineer, and later was transferred to the Bunnell plant, where he was made assistant plant manager in 1953. Mr. Klein is a graduate in chemical engineering from Drexel Evening School, Philadelphia, Penn.

Mr. Haigh is a graduate of Georgia Institute of Technology, Atlanta, Ga., in mechanical engineering. Upon his release from active duty in the U. S. Navy, he completed his course at G.I.T. and then served for two years in the construction of chemical plants. He joined Lehigh at Birmingham in 1948 and was appointed plant engineer in 1950.

Mr. Gaston, prior to graduation from Lehigh University, Bethlehem, Penn., in chemical engineering, was employed as an analyst in the Ormrod plant laboratory. Following his graduation, he began the training course in process control and was promoted to plant engineer at Ormrod in 1952.

During World War II, Mr. Gaston served five years in the U. S. Air Force.

Mr. Jondal is a graduate of the University of Minnesota, Minneapolis, Minn., in chemical engineering. During World War II, he served in the chemical warfare service and the Army Engineer Corps. Prior to joining Lehigh at the Oglesby plant in 1946, Mr. Jondal did engineering work at the Oak Ridge and Los Alamos atomic plants. He was promoted to plant engineer at Oglesby in 1949.

Lone Star Officers Retire

TH. AVNSOE, vice-chairman of the board of directors of Lone Star Cement Corp., New York, N. Y., and E. Posselt, formerly vice-president in charge of engineering and for the past

president, and vice-chairman of the board. Mr. Avnsøe continues to serve as a member of the board.

Mr. Posselt joined the Argentine Portland Cement Co. in 1918, just prior to the time it was acquired by



E. Posselt

Lone Star Cement Corp., then the International Cement Corp. He has served the company as consulting engineer in Argentina and Uruguay, and as vice-president in charge of engineering from 1921 to 1952. Since then he has been serving as consulting engineer.



Th. Avnsøe

two years consulting engineer, have retired from active service, and have been appointed to a newly created president's advisory committee.

Mr. Avnsøe, who joined the company in 1917, has been in the cement industry since 1911. He has served successively as chief engineer, general superintendent, vice-president in charge of operations, executive vice-

P.C.A. President

G. DONALD KENNEDY, executive vice-president of the Portland Cement Association, Chicago, Ill., has been elected president to succeed Carl D. Franks, who has retired. Mr. Kennedy joined the association in 1950 as consulting engineer and assistant to the president. He was named vice-president in 1952 and executive vice-president in 1953. A graduate of the University of Michigan, Ann Arbor, Mich., where he received his degree in civil engineering, Mr. Kennedy served in municipal activities in Michigan. In 1933 he joined the State Highway Department of Michigan, later becoming highway commissioner of that



Left to right: Philip E. Carlson, William J. Klein, Fred G. Haigh, Edgar G. Gaston, and Robert C. Jondal

state. In 1942 he was elected president of the American Association of State Highway Officials, and from 1943 to 1950 served as vice-president of the Automotive Safety Foundation, Washington, D. C.

Mr. Franks joined the Portland Cement Association in 1916 as district engineer in charge of the Indianapolis office. Eight years later he was appointed midwestern regional manager, and in 1948 became vice-president for promotion. He was appointed executive vice-president in 1952 and one year later was elected president. Mr. Franks is a graduate of Purdue University, Lafayette, Ind., where he received his B.S. degree in civil engineering. Mr. Franks will continue to serve the P.C.A. as consulting engineer.

Heads Museum

CHARLES HORNER, president of Kosmos Portland Cement Co., Inc., Kosmosdale, Ky., has been elected president of the J. B. Speed Art Museum, succeeding J. Adger Stewart who passed away recently.

OBITUARIES

OTHO MCCARROLL GRAVES, chairman of the board of directors of the General Crushed Stone Co., Easton, Penn., died October 15 at his home in Easton. He was born in Louisville, Ky., February 9, 1882. The middle name that few of his friends knew came from his mother who was born Eliza Graeme McCarroll.

Mr. Graves graduated from Tufts College, Medford, Mass., in 1906 with the degree of bachelor of science in civil engineering. His practice of engineering, however, was brief — as an engineer of the American Thread Co., and as chief engineer of the Scranton (Penn.) Street Railway Co. Thereafter until 1918 he was an instructor and professor of civil engineering subjects, first at the University of Pennsylvania and subsequently at Lafayette College in Easton. As a professor he was the author of several textbooks for engineering students.

In 1918 he was selected by the late John Rice to be his assistant as president of the General Crushed Stone Co. Subsequently, he became general manager, vice-president and president of the company. After the death of John Rice some years ago, Mr. Graves became chairman of the board of directors. He was active in several civic enterprises and in several industrial groups, but his chief interest in life was the National Crushed Stone Association of which he was president for four successive years — much longer than any other man, and a

member of its board of directors, and of its executive committee, throughout his entire business life; a distinction never equalled by any other member.

During the New Deal days when all industry was organized under various Code Authorities, Otho Graves was the unanimous choice of chief of the Code Authority of the Mineral Aggregate Industries, including crushed stone, sand, gravel and slag. An appreciation of his services to industry will be found on another page of this issue under Rocky's Notes. He is survived by a married daughter (Virginia) Mrs. Richard Tift and her two children, of Oreland, Penn.

THOMAS WILLIAM BROWN, former vice-president and general manager of the Utah Concrete Products Corp., Salt Lake City, Utah, died October 10 in Yakima, Wash., where he was visiting a daughter. He was 72 years of age. Mr. Brown, who retired in 1946, served as superintendent of the Massey Concrete Products Corp. plant from 1918 to 1925. He then joined the Utah Concrete Products Corp., serving as vice-president and general manager until 1936, when he became associated with the Union Portland Cement Co., where he remained until his retirement.

C. RALPH BINKLEY, vice-president and general manager of Binkley Bros., Inc., East Petersburg, Penn., died October 25. He was 48 years old. A native of Neffsville, Penn., Mr. Binkley was also vice-president and a director of Bradford Hills Quarry, Inc., Milton Grove Sand, Inc., and the Ready Mixed Concrete Co., Lancaster, Penn. He was president of Chester Carriers, Inc., and a director of Donegal Manufacturing Co., Marietta, Penn.

MORRIE W. WINSCH, who was plant superintendent at the Northampton, Penn., plant of Universal Atlas Cement Co., New York, N. Y., until his retirement in 1947, died suddenly on October 17. He was 72 years of age. Mr. Winsch started with Universal Atlas as a draftsman and subsequently became master mechanic, maintenance superintendent and then plant superintendent at Northampton. He retired in 1947, after 43 years of service, to head the newly formed Cement Information Council, Bethlehem, Penn.

SWAIN JOSEPH SWAINSON, director of the mineral dressing laboratories of American Cyanamid Co. at Stamford, Conn., died October 22 at Southold, Long Island, after a long illness. He was 53 years old. Born in Mountain, N. D., Mr. Swainson graduated from the University of North Dakota in 1924, and received his M. S. degree from the University of Utah in 1925. Internationally known in the field of

mineral dressing, Mr. Swainson was author of numerous papers published in technical journals dealing with this field, particularly on improvements in froth flotation and heavy media separation. He was a member of the American Institute of Mining and Metallurgical Engineers since 1935, and served on many committees. He was one of the founders of the Mineral Beneficiation Division, and recently was chairman of the Robert H. Richards Award Committee.

WILLIAM FOWDEN, who managed the South Dakota Cement Plant, Rapid City, S. D., for 20 years before his retirement in 1944, died October 17 at the age of 86. Mr. Fowden had spent over 50 years in the cement industry. He became manager of the South Dakota plant in 1924 and remained there until his retirement in 1944, when he was succeeded by Frank Gardner and became consulting engineer.

DENZIL C. WILSON, Sr., vice-president and treasurer of the Englewood Sand and Gravel Co., Inc., Englewood, Ohio, died October 9, after a three-year illness. He was 58 years old. Previously he had been associated with the Universal Atlas Cement Co. in Fairborn and Cleveland, Ohio, for 18 years.

MRS. IRMA SCHWALBE, vice-president of the Economy Block Co., Wauwatosa, Wis., died October 13, after a short illness. She was 58 years old. Born in Wauwatosa, Mrs. Schwalbe was the widow of Lester E. Schwalbe, president of the block company until his death several years ago.

DOUGLAS W. DEMLER, New Jersey sales manager for Dragon Cement Co., Inc., New York, N. Y., passed away October 19 at his home in Watchung, N. J. He had been associated with the company for 42 years.

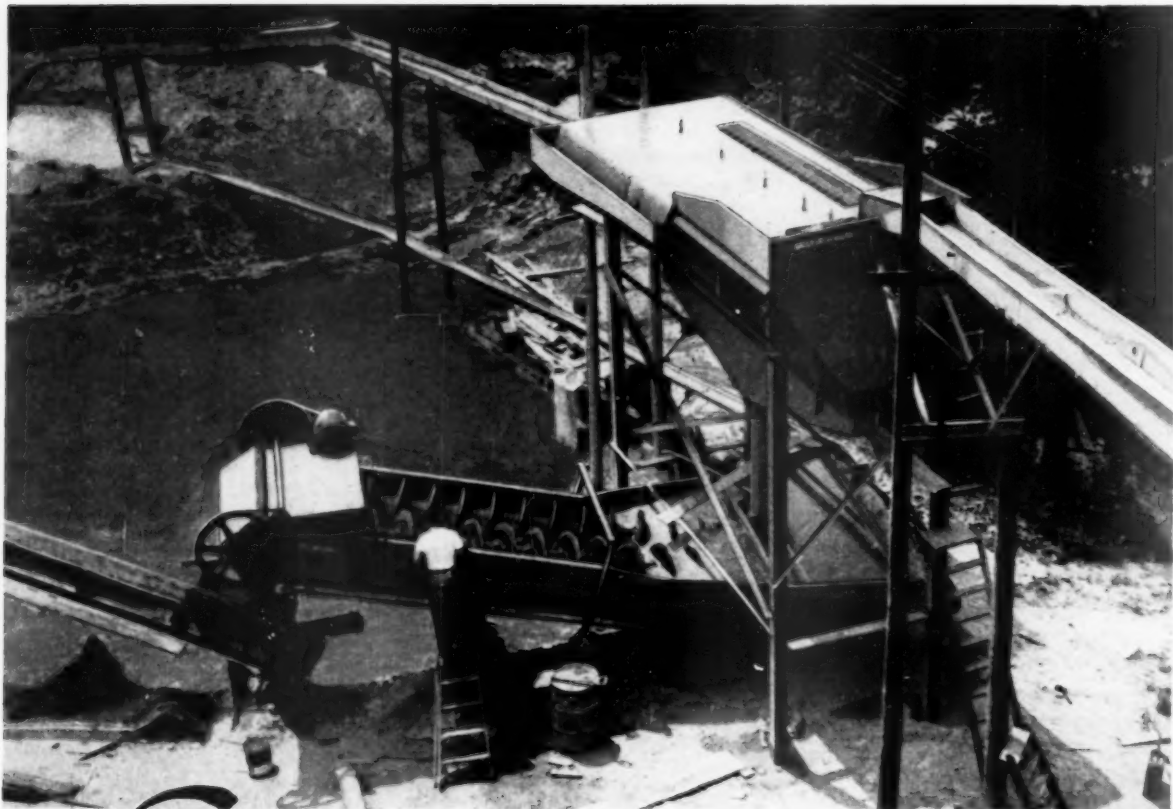
JOHN M. LYTLE, a partner with his brother, Willard, in the sand and gravel firm of Lytle Bros., Cleveland, Ohio, died recently at the age of 76.

JAMES F. M. STEWART, chairman of the board of Standard Paving Materials, Ltd., St. Hyacinthe, Quebec, Canada, died recently at the age of 75.

ALEXANDER JAMES REID, secretary-treasurer of St. Mary's Cement Co., Toronto, Ontario, Canada, died October 10. He was 71 years of age.

EDWARD NORRIS LEIGH, owner of the Lake Shore Cement Products Co., Michigan City, Ind., died suddenly on September 14. He was 47 years old.

FRANCIS BRADFORD MURRAY, former New York division sales manager for U. S. Gypsum Co., Chicago, Ill., died recently at the age of 58.



Eagle

AGGREGATE WASHING-CLASSIFYING UNIT ASSURES MATERIALS TO SPECIFICATION FOR MATERIAL TRANSIT CO., NEW CASTLE, DELAWARE

MATERIAL Transit Co., like so many producers everywhere, found that there is only one sure, economical and profitable way to wash and classify materials—the Eagle Way!

The progressive Saienni brothers, Sam, Elmer and Bill, owners of Material Transit Co., report highly satisfactory performance from their Eagle equipment, which produces a high quality concrete sand, readily meeting area specifications.

The Saienni brothers Eagle equipment consists of a 20' Eagle Water Scalping Tank to which material flows from a nearby wet screen, and

a 30" x 25' Long Weir, Double Screw, Fine Material Washer-Classifer-Dehydrator.

The factory-trained Eagle distributor in the area rendered yeoman service in getting the washing plant set up properly and schooling the operator.

Eagle has installed so many plants, encountered every conceivable condition, and has such broad experience that no aggregate producer need be a "guinea pig"—when you install Eagle equipment you can be sure that it will function to your satisfaction and quickly return its cost. The 82 year old Eagle organization stands back of every installation. Fast parts service is available even on the first Eagle washer built.



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INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S COVER is an illustration of the Kaiser Gypsum Co., Inc., wallboard plant depicting the



long Coe dryer and alongside the Ehram board machine with long Raybestos-Manhattan conveyor belt. The new gypsum calcining plant and wallboard plant with auxiliary

material handling facilities cost approximately \$4,000,000. These plants will have an annual capacity of 100,000,000 sq. ft. of $\frac{3}{8}$ -in. gypsum board products and 35,000 tons of hardwall and other types of special gypsum plasters.

Acquires Cement Company

IDEAL CEMENT CO., Denver, Colo., has acquired the assets of Spokane, Portland Cement Co., Spokane, Wash., which includes the cement plant at Irvin, Wash., near Spokane, and quarries at Marble and Boyds, Wash. Annual capacity of the Irvin plant is 650,000 bbl., bringing Ideal's total cement producing capacity to approximately 21,000,000 bbl. per year.

G. M. Bell, president, Spokane Portland Cement Co., revealed that owners of 166,430 shares, or 83 percent of the 200,000 shares outstanding, voted in favor of the sale. Net realization for the 525 Spokane shareholders reportedly amounted to about \$1,600,000, or \$8 per share.

Ideal's cement production now serves a great part of the western half of the nation, with plants at Gold Hill, Ore.; Redwood City and San Bautista, Calif.; Hanover and Trident, Mont.; Devils Slide, Utah; Boettcher and Portland, Colo.; Superior, Neb.; Ada, Okla.; Okay, Ark.; Houston, Texas; Baton Rouge and New Orleans, La.; and Mobile, Ala.

Diamond Drilling for Perlite

WHAT IS BELIEVED to be the first perlite deposit to be explored by diamond drilling was on perlite property owned by Northwest Perlite Co., Portland, Ore., as recently reported by the Oregon State Department of Geology

and Mineral Industries. The deposit, located east of Sheaville, Ore., in Malheur County, was explored by diamond drilling during June and July, with drilling operations performed by Nichols-Thompson Drilling Co., Boise, Ida. A total of 361 ft. was drilled in 12 holes, the deepest of which was 48 ft. Despite the characteristic shell-like fracture of this volcanic glass, excellent core recovery was reported.

National Gypsum Begins Canadian Development

NATIONAL GYPSUM CO., Buffalo, N. Y., recently announced that construction of mine and dock facilities at the company's new gypsum properties near Halifax, N. S., are already well underway. The Halifax development, which is estimated to cost approximately \$6,000,000, is expected to be ready for full-scale quarrying operations by the spring of 1955 and, according to Melvin H. Baker, chairman of the board, the new mineral reserves will supply the company's needs at its four Atlantic Seaboard plants for at least 200 years.

The new deposit, which was discovered and proved two years ago by company geologists, reportedly is the largest yet discovered in North America. Development of the mine is part of National Gypsum's 4-year, \$37,000,000 expansion program scheduled for completion by mid-1958. The company is also expanding capacity at its

gypsum products plants in New York, Baltimore, Md., Savannah, Ga., and Portsmouth, N. H., by 25 percent, at an estimated cost of \$3,500,000. Consideration is also being given to the establishment of a gypsum manufacturing plant in Canada, according to the official announcement.

The Halifax development was planned by National Gypsum's Engineering Dept., under the direction of S. David Skinner. Walter H. Wetzel, chief mechanical engineer, is in charge of the project.

At the town of Milford, 30 miles from Halifax, a railroad bridge and necessary buildings and equipment at the quarry site are being built. Overburden is being stripped away from the deposit, preliminary to quarrying operations. At Dartmouth, across the bay from Halifax, construction has been started on docks large enough to receive 12,000-ton ships. Cranes, conveyors and other facilities capable of unloading a ship in four hours are also under construction. The dock project is located on a 3-mile extension of the Canadian National Railroad. The new ship loading and handling equipment reportedly will cut in half the loading time necessary at the company's present quarries in the northern part of Cape Breton Island, where ice conditions suspend shipping during five winter months. Halifax is a year-around, ice-free port. The round-trip haul will be reduced by 500 miles when the dock facilities are completed.



S. David Skinner, director of engineering, planned the company's \$6,000,000 development of deposits near Halifax, N. S.



Walter H. Wetzel, chief mechanical engineer, is supervisor of entire gypsum project at the Nova Scotia site

Penn-Dixie Acquires Petoskey

PENN-DIXIE CEMENT CORP., New York, N. Y., recently announced acquisition of Petoskey Portland Cement Co. and Petoskey Transportation Co., Petoskey, Mich. The acquisition adds approximately 1,600,000 bbl. of cement annually to Penn-Dixie's former 8-plant output of about 11,300,000 bbl. The announcement, which was made by B. W. Druckenmiller, Penn-Dixie president, revealed that the company had acquired more than 90 percent of the outstanding common stock of both Petoskey companies at \$20 per share. The cement company had 250,000 shares outstanding and the transportation company, 57,711. The same offer reportedly is being made to the remaining stockholders.

A plant modernization and expansion program, to cost an estimated \$1,000,000, is to be started immediately, according to Mr. Druckenmiller. The program will include the installation of new crushing equipment, new coolers, and new trucks for use at the quarry.

The Michigan companies will now be operated under the Penn-Dixie firm name.

Potash Mine

WESTERN POTASH CORP., LTD., Toronto and Calgary, Canada is developing its potash deposits at Unity, Saskatchewan, where it has contracted for the mineral rights under 120,000 acres, estimated to contain 2.5 billion tons of potash. A freezing process was used to overcome the problem presented by quicksands in sinking a shaft to the potash deposits which lie approximately 3500 ft. below the ground surface.

The Potash Co. of America, Carlsbad, N. M., reportedly is also interested in the possibility of working the Saskatchewan deposits, and testing operations are in progress. The company has acquired exploration rights in a large area near Saskatoon and has entered into a commitment to spend \$3,000,000 for sinking a shaft if it is decided to proceed.

Potash deposits in Saskatchewan are reported to be the third largest in the world, underlying most of the southern part of the province.

National Gypsum Expansion

NATIONAL GYPSUM CO., Buffalo, N. Y., recently began development work on the first gypsum deposit discovered in Indiana. The company's mine, located on a 2700-acre mineral deposit, 2 3/4 mi. northeast of Shoals, Ind., will begin production of gypsum rock on a limited basis early in 1955, according to Melvin H. Baker, chairman of the board. The mine reportedly will be the deepest gypsum opera-

tion in the United States and is the first time gypsum has ever been discovered below 550 ft. Mr. Baker disclosed that diamond drilling was started in 1952 and the limits of the deposit had been determined by the summer of 1953. Part of the deposit is located in the Martin County State Forest.

Proposes Stock Increase

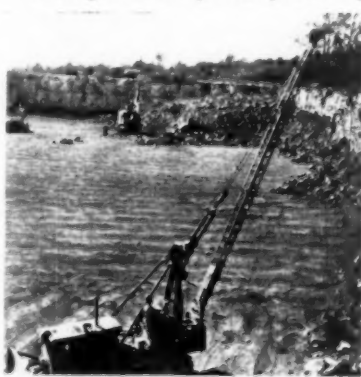
LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has called a special stockholders' meeting to vote on proposals to increase the authorized capital stock from the presently authorized 2,406,382 1/2 shares to 4,000,000 shares (\$25 par value), and to increase the authorized indebtedness of the company to \$10,000,000. The increased debt and capital stock authorizations reportedly are being sought to give the company "sufficient flexibility to take prompt advantage of whatever opportunities for profitable growth and enlargements there may be in the future."

Lehigh currently has 1,901,560 common shares outstanding. The company has expended about \$9,000,000 in 1954 for modernization and rehabilitation of its cement plants, principally at the Alsen, N. Y., operation. Last May, the company announced plans to expand the capacity of its \$15,000,000 Bunnell, Fla., plant by 80 percent.

Multi-purpose Tractors

A CRAWLER TRACTOR, with crane, drop ball and a bulldozer blade, reportedly is doing the job of two machines at an increasingly large number of quarries. This two-purpose machine cleans the quarry floor to hold down tire wear on hauling equipment and is also used for secondary breaking, employing the drop ball.

Among the companies pioneering



Crane and drop ball mounted on crawler tractor, also equipped with bulldozer blade, does all secondary breaking as well as cleaning of quarry floor at Marquette Cement Co.'s limestone quarry near Lebanon, Tenn. Crusher at this quarry supplies 1500-1600 tons of 6-in. minus stone per day. Stone is hauled 20 mi. to company's cement plant at Nashville.

the application of the double-duty machine is Marquette Cement Mfg. Co. The machine went into operation at the company's Martha plant near Lebanon, Tenn. The Martha plant crushes 1500-1600 tons of limestone per day to 6-in. size. The limestone is shipped by rail to Marquette's cement plant at Nashville. The machine, which is a Hyster Hystaway crane mounted on a D8 Caterpillar tractor and equipped with a 3200-lb. drop ball, reportedly has effected considerable economy in the quarry operations since it makes only one operator necessary and reduces secondary shooting costs.

Among other companies using the machine is Franklin Limestone Co., Nashville, Tenn., which has three in operation. The first was placed in operation in July, 1951, and the others were added in July, 1952, and in January, 1953. Cowan Stone Co., Cowan, Tenn., also uses the Hystaway-tractor combination for secondary breaking, and National Cement Co. installed a similarly equipped machine at its Ragland, Ala., quarry.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 25,681,000 bbl. of finished cement in August, 1954, as reported by the Bureau of Mines. This was an increase of 6 percent over the August, 1953, figure. Mill shipments totaled 28,802,000 bbl., 6 percent above the shipments in August of the previous year, while stocks were 13 percent lower than those on hand for the same month of 1953. Clinker production during August, 1954, amounted to 24,626,000 bbl., an increase of 5 percent from the August, 1953, total. The output of finished cement during August, 1954, came from 157 plants located in 37 states and Puerto Rico. During the same period of 1953, 24,289,000 bbl. were produced in 156 plants.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of October were listed by the Portland Cement Association as follows:

	Sq. yd. awarded during October, 1954
Roads	5,484,892
Streets & Alleys	2,308,817
Airports	581,889
	8,375,598

Acquires Gypsum Deposit

PABCO PRODUCTS CO., San Francisco, Calif., reportedly has acquired a gypsum deposit at Lovelock, Nev., from Ideal Cement Co., Denver, Colo. The deposit, believed to be the nearest one of its kind to the Bay area, was said to have been acquired for future development. Pabco Products Co. has also started construction of an asphalt roofing plant at Wilmington, Calif.

Acquires Canadian Limestone Option

IDEAL CEMENT CO., Denver, Colo., has announced acquisition of an industrial site near Vancouver, B. C., and options on nearby limestone properties, with a view to further expansion into the Northwest and British Columbia. During the past nine years, the company has expended approximately \$40,000,000 to expand its capacity from 7,000,000 to 20,000,000 bbl. of cement production per year. During that period, Ideal has acquired two new plants at Mobile, Ala., and Baton Rouge, La.; a bulk terminal at New Orleans, La.; new facilities at Portland, Colo., and Devils Slide, Utah; new producing capacity at Houston, Texas, Ada, Okla., Superior, Neb., and Trident, Mont.; and built a new central research laboratory near Denver, Colo.

Metallurgical Fluorspar

THE GENERAL SERVICES ADMINISTRATION recently announced that it has been authorized by the Office of Defense Mobilization to purchase domestic metallurgical-grade fluorspar for the nation's "long term" stockpile of critical and strategic materials. O.D.M. is presently setting "interim" goals of domestically produced metals and minerals which call for amounts of materials in excess of the "minimum" stockpile goals. The new goals are designed to provide a safeguard against the loss of domestic production facilities in wartime and to keep current domestic production at a high level.

Lime Company Sold

GAGER LIME CO., Sherwood, Tenn., which closed operations in October, 1949, has been acquired by Dillon Green, Chattanooga, Tenn. The plant, which was previously owned by the Procter and Gamble Soap Co. and the Gager family, was at one time considered the largest producer of lime in that section of the country. Immediate plans for the plant and facilities have not been revealed.

To Open Bentonite Mine

MINERALS MINING CO., Cody, Wyo., recently announced plans to start mining its bentonite property in Cody, Wyo., area. Officers of the company include Reuben Swanson, Billings, Mont., president, and Walter Ray, Medora, N. D., chairman of the board.

Sand and Gravel Plant

A NEW SAND AND GRAVEL OPERATION and a ready-mixed concrete plant have been opened at Oregon City, Ore. Howard Jones and Earl Stewart are in charge of the sand and gravel

operations, and the ready-mixed concrete plant is under the management of Roy Smith and Archie Hodges. Also affiliated with the new firm is Sam Gregson, who is in charge of the crushing and stockpiling operations.

Wins Advertising Award

BASIC REFRACTORIES, INC., Cleveland, Ohio, was recently named one of the 23 recipients of the "Second Annual Saturday Review Awards" for distinguished advertising in 1953. The award is presented "to recognize annually national advertisements which best serve the public interest, and which most searchingly document the continuing miracle of America." The citation pointed out the company's "Big Business" campaign as "an outstanding achievement in the field of institutional advertising." Overall theme of the ad series illustrates the immense contribu-

tions of "Big Business" to the health, wealth and prosperity of this country.

Earlier this year, Basic Refractories was also awarded the Freedom Foundation's George Washington Honor Medal for this ad series. The citation read, "An outstanding achievement in helping to bring about a better understanding of the American way of life." Copies of these 13 ads, in booklet form, are available from the company upon request.

Correction

THE AUTHOR of the article, "Determining Degree of Burning in Kilns by Liter-Weight of Clinker," appearing on page 76, November issue of ROCK PRODUCTS, should have been given as G. Wadstrand of AB Inter-Cemex, Stockholm, Sweden. This article was erroneously credited to Dr. F. O. Anderegg as the author.

Coming Conventions

December 15-16, 1954—

Missouri Limestone Producers Association, 10th Annual Meeting, Daniel Boone Hotel, Columbia, Mo.

January 9-13, 1955—

National Ready Mixed Concrete Association, Silver Anniversary Convention, Miami, Fla.

January 9-13, 1955—

National Sand & Gravel Association, 39th Annual Convention, Miami, Fla.

January 10-13, 1955—

American Road Builders' Association, Annual Convention and Highway Materials and Supplies Exhibit, Roosevelt Hotel, New Orleans, La.

January 12-13, 1955—

Wisconsin Concrete Products Association, 35th Annual Convention, Plankinton Hotel, Milwaukee, Wis.

January 17-18, 1955—

National Agricultural Limestone Institute Inc., 10th Annual Convention, Hotel Statler, Washington, D. C. Executive Committee, January 15, Board Meeting, January 16.

January 24-27, 1955—

National Concrete Masonry Association, Convention and Exposition, Cleveland, Auditorium, Cleveland, Ohio.

February 7-9, 1955—

National Crushed Stone Association, 38th Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio.

February 21-24, 1955—

American Concrete Institute, 51st Annual Convention, Hotel Schroeder, Milwaukee, Wis.

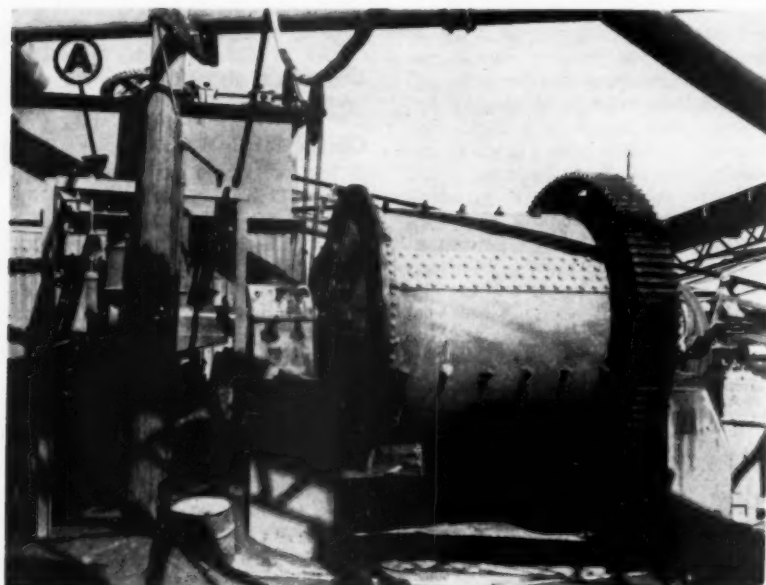
March 9-12, 1955—

American Concrete Pipe Association, 47th Annual Convention and Meeting, Sheraton-Plaza Hotel, Boston, Mass.

HINTS

AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN



Ball mill installation; "A" points to beam or fulcrum of drum that serves as a scale pan

Ball Mill Improves Sand Characteristics

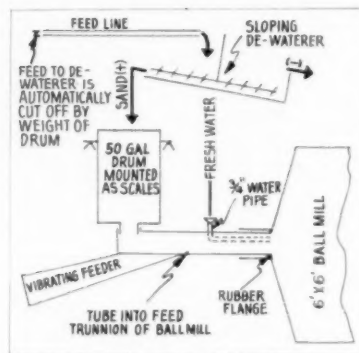
THE SOUTH DENVER PLANT of the Cooley Gravel Co. is a temporary one. It is a land-based unit and is essentially a pilot plant to work out a flow sheet in which all equipment can be mounted on a dredge similar to the North Denver plant, described in *ROCK PRODUCTS*, March, 1953, page 94. A ball mill is currently being used as a means of up-grading the sand. After the ball mill was installed, concrete made from the sand so processed did not bleed, and it had better workability

and finishing characteristics. Tests indicated that concrete strengths were increased equivalent to $\frac{1}{4}$ to $\frac{1}{2}$ a sack of portland cement and did not increase water requirements.

The ball mill is a 6- x 6-ft. Colorado Iron Works unit (now Mine & Smelter Supply Co.) with a modified grate discharge. It is fed 8 to 10 t.p.h. and uses a 75-hp. motor. Shell liners are corrugated manganese steel with Jallopy end liners. The mill, which is loaded with a 10-ton balanced ball load, is replenished with 2½-in. dia. balls to compensate for wear. Ball and liner wear amounts to about one pound per

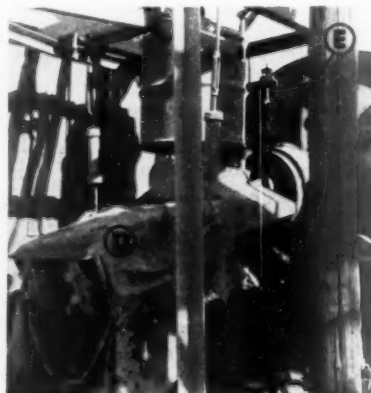
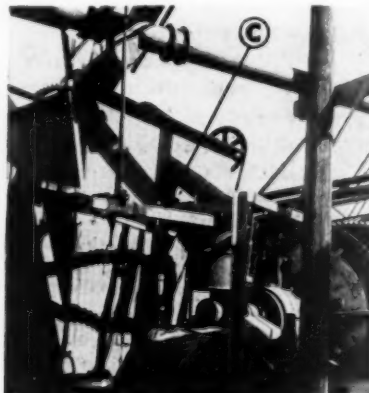
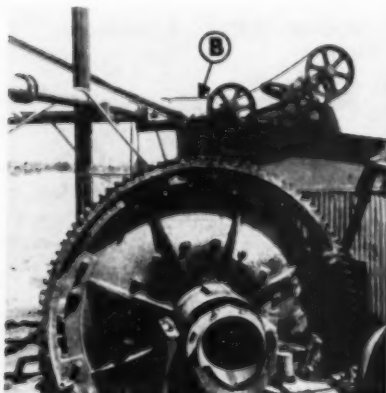
ton of feed. The ball mill operates at 25 r.p.m. with the discharge being held at around 80 percent solids. It is fed a minus $\frac{3}{8}$ -in. to No. 16 feed.

A novel feature of the installation is the use of a company-made, automatic weight feeder. The minus $\frac{3}{8}$ -in., plus No. 16 feed is de-watered in a 6-ft. dia. sloping, paddle-type unit that discharges into a 50-gal. oil drum that is essentially a pair of scales which open (or shut off) the feed to the de-watering paddles. Immediately under the drum is a Jeffrey electric vibrating feeder having a tube for an outlet. The tube extends through the feed trunnion of the ball mill, as shown in



Elevation details of ball mill installation showing controlled feed arrangement

the illustration. Fresh water is fed at the same time into the ball mill with the water pipe extending to the inside of the ball mill drum. A rubber flange inside the trunnion prevents any material working past the end of the delivery tube from the Jeffrey feeder. The discharge from the mill, which is



Left to right; Ball mill features; "B" shows the sloping dewaterer ahead of ball mill with a scale assembly to open or close feed line to dewaterer; "C" points to drum mounted so that it serves as a scale and controls feed to dewaterer; "D" is the vibrating feeder; and "E" is the tube affixed to vibrator and passing through ball mill trunnion at feed end

picked up by a 2-in. Allis-Chalmers rubber-lined, centrifugal pump, is blended in with other sand produced in the plant.

If discharge solids are kept below 80 percent, the size of the discharge product is increased, and the excess water is a deterrent to blending on the sand belt. Three typical screen analysis of the discharge follow:

Mesh	Percent Passing		
	No. 1 (coarse)	No. 2	No. 3
4	100	100	—
8	—	98.5	—
10	98.1	—	98.6
16	95.3	94.3	93.2
30	80.0	83.6	78.1
40	71.7	—	66.4
50	60.4	52.6	54.8
80	45.3	—	40.4
100	39.6	41.8	34.9
200	24.6	25.4	20.6

Recovering Fine Sand With Liquid Cyclone

AT A SAND PROCESSING PLANT in the South, a 36-in. dia. liquid cyclone is used to recover finer sizes of sand



A 36-in. liquid cyclone over hopper recovers fine sand which is blended with coarser sand on belt conveyor

than can be recovered by de-watering units. The pulp is pumped to the liquid cyclone tangentially and under pressure. The centrifugal action within the cone makes the separation of fine sand from slimes. At the same time, the de-watering screws are preparing a coarser fraction in another section of the plant.

The liquid cyclone is installed over a holding hopper mounted directly over the car being loaded. A belt conveyor delivers the coarse fraction from the dewatering section to the holding hopper where it is joined by the fine sand ejected from the cone of the liquid cyclone. This arrangement makes a satisfactory blend. The holding hopper is of sufficient capacity so that operations do not have to slow down while cars are being spotted for loading.



Short belt conveyor takes impact of falling stone from crusher

Wear-Taking Belt Conveyor

CONSIDERABLE MONEY could be saved on belt conveyor maintenance if a practice of many portable plant operators was followed. In the illustration may be seen a short conveyor belt which receives the impact of crushed rock falling from the primary crusher. The short belt conveyor delivers to the longer (and more expensive) belt conveyor. Belt speed for both conveyors should be the same as there are obvious advantages of transferring material from one belt to another at the same speed. The roller chain from the fly-wheel shaft of the crusher drives the short belt conveyor under the 2540 Cedarapids primary crusher. A Syntrol vibrating grizzly is located ahead of the crusher.

Portable Air Supply

IN THE TWO ILLUSTRATIONS may be seen two extremes in air delivery involving portability. One view shows three air cylinders clustered on a sled. As this arrangement was used in a cold climate, a heater accompanied it. Incidentally, the company using this arrangement later installed a rotary drill that practically eliminated this sled method of moving air tanks. The second illustration shows a Gardner-Denver compressor mounted on an International truck for portability with-

in the quarry and also for transportation to other quarry properties.



Above: Compressor mounted on truck for convenient portability. Below: Three air storage tanks nested on sled supply air at a remote location

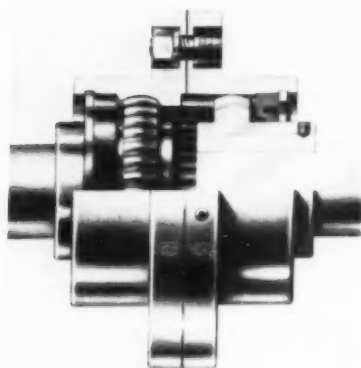
Portable Screening Unit

A WESTERN PRODUCER has set up a light portable screening unit for re-screening gravel to fill any odd-lot orders that might be sold. The unit consists of a Fairfield Engineering Co. hopper and an inclined belt conveyor that delivers material to a 4- x 10-ft. Universal vibrating screen.



Small, portable screening unit used to re-screen gravel for special orders

NEW MACHINERY



Spherical Tooth Couplings

PHILADELPHIA GEAR WORKS, Erie, Ave. and "G" St., Philadelphia 34, Penn., has introduced Sphreflex couplings with the male teeth of each coupling half cut on a spherical arc, and the internal teeth cut with a straight root, to provide a constant area of contact whenever misalignment occurs. The teeth are of uniform thickness from side to side, and regardless of the nature of the misalignment, a complete line contact is said to be maintained between the coupling teeth, while point contact is never possible. No thrust load on the bearings is said to develop through the coupling. Standard couplings are available in sizes 0 through 6 (maximum bore 6 $\frac{5}{8}$ in.), while larger couplings for heavy duty service can be made to order. A selection of floating shaft and vertical couplings utilizing the Sphreflex principle are also available.



Collapsible Containers

UNITED STATES RUBBER CO., New York 20, N. Y., has introduced "Seald-Bin" containers of 500- and 2500-gal. capacities for bulk shipment of granular and powdered materials. The containers are made of tire cord fabric with an exterior and interior lining of

neoprene to provide resistance to aging, weathering, abrasion and corrosion. Strong, flexible lifting cables, on the inside of the container are attached to a single lifting ring at the top. Air or gas can be pumped into the filled container for additional rigidity during handling. The containers are collapsible for storage or return shipment, and have a 6-in. closure in each end for emptying and filling.

Classifier

DENVER EQUIPMENT CO., Terminal P. O. Box 5268, Denver 17, Colo., has introduced the "Denver-Finney" classifier, which operates on the surface-current classification principle. A rubber conveyor belt is troughed at the lower end of the conveyor to form a pool in which the classification takes place. Conventional mechanical raking is replaced by the belt which conveys settled material to sand discharge, and also reduces pool turbulence and results in more accurate separation. Fines overflow the lower pulley. Regulation of size separation, height of discharge, belt speed, pool area, etc., is facilitated by several simple adjustments.



Grinding Mill

O. J. BLACK, Bishop, Calif., has started the manufacture of a grinding mill for small operations. The mill will take stone up to 4 x 8 in. and reduce it to minus 12-mesh at the rate of 1 $\frac{1}{2}$ t.p.h., using a 15 hp. motor. Of welded steel construction, all parts are said to be properly stressed before machining. Ball bearings are used at the main stress points and all working parts are dust-protected. The machine weighs 2 ton.

It has a specially designed crushing chamber with a choke feed to give an inter-particle grind to break the stone at the weak points. The crushed ma-

terial is immediately screened and the over-size returned for more grinding with all these operations being an integral part of the mill.

The mill was developed to grind tungsten ores where the mineral to be recovered is scheelite. This is an easily friable mineral in a hard, tough host-rock. Over-grinding will slime the tungsten ore fraction which is highly undesirable. The mill is said to give high recoveries with a minimum of slimes.

The machine may have applications in the rock products industries where a small amount of minus 12-mesh material is wanted.



Palletizing System

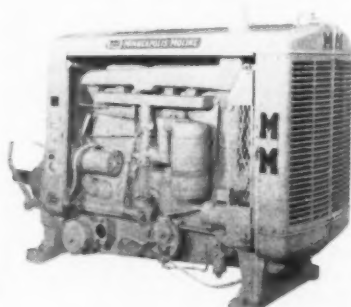
AMERICAN CYANAMID CO., 30 Rockefeller Plaza, New York 20, N. Y., has developed an industrial palletizing system featuring the Accopak pallet. The pallet consists of a paper sling fitted with two cardboard tubes. A bayonet fork assembly, readily attachable to a fork lift truck, slips into the tubes, enabling the palletized load to be lifted, carried and stacked in single, double or triple-deck tiers without removal of the pallet during storage or shipment. The slings, made of Melostrength resin-treated paper for greater strength, wet or dry, are no thicker than heavy wrapping paper. The entire pallet weighs less than 3 lb., and, for storage, may be rolled up like a map or stored flat, with the tubes tied in a bundle. It is assembled by inserting the tubes in the end of the sling. The Accopak pallet is being patented

by American Cyanamid Co., which will offer manufacturing license to companies in the paper industry.



Single Pass Crusher

IOWA MANUFACTURING CO., Cedar Rapids, Iowa, has announced a single pass portable crushing plant for producing two sizes of gravel. It consists of a 6- x 6-ft. loading hopper equipped with a sloping bar grizzly with 7-in. openings; an 18-in. reciprocating plate feeder with adjustable feed stroke and feed gate; a 2- x 6-ft. double-deck Model "H" inclined vibrating screen; a 10- x 24-in. roller bearing jaw crusher; 24-in. x 25-ft. channel frame delivery conveyor; 14-in. x 20-ft. sand conveyor; and a 36-hp. gasoline engine. The plant is mounted on a rubber-tired full-trailer, goose-neck type with an upper fifth wheel plate. The hopper and feeder are mounted on the rear end of the plant and the dolly on the front, permitting the plant to be backed up to a gravel bank into operating position. The plant produces approximately 40 to 75 t.p.h. of 1½-in. material under proper operating conditions.

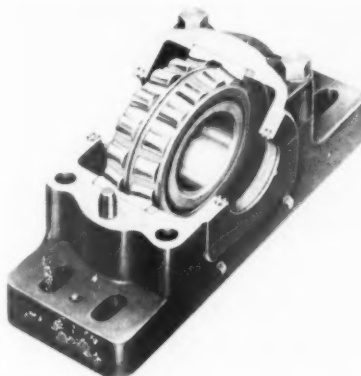


Heavy-Duty Engine

MINNEAPOLIS-MOLINE CO., Minneapolis 1, Minn., has brought out the 800-6A, 800-cu. in. displacement engine, built and equipped for 24-hr. continuous heavy-duty operation, with an MM heat exchanger base pan as regular equipment. The pan is water jacketed and acts as a heater or cooler to maintain a uniform and proper oil temperature. The engine has six cylinders, 5⅝-in. bore, 6-in. stroke, and is designed for operation on gasoline, natural gas or LP gas fuels. The drop-forged steel crankshaft weighs 292 lb.,

has 3¼-in. dia. connecting rod bearings and 3½-in. main bearing diameter. Four main bearings and a built-in counterbalance increase the stability of the crankshaft. The crankcase has a large diameter flange mounted to the SAE power take-off housing that provides a full 360-deg. support. The power shaft is 3 in. in dia., and is equipped with a double-disc 14-in. industrial clutch.

Two 6½- x 9½-in. oil filter cartridges are located in the heat exchanger base pan, with ample capacity for a normal season of continuous operation without changing oil filters. Either oil or filters may be changed independently without changing the other.



Pillow Blocks

LINK-BELT CO., 307 N. Michigan Ave., Chicago 1, Ill., has added pillow blocks with heavy-duty self-aligning roller bearings for press fit on shafts to its line of "Mill Bearings." Designated Series LPK7800F, the bearings have steel split housings, and the caps and bases are secured with four extra-heavy bolts and large dowels. A bore size range of 3.1496 to 7.4803 in. is available.

Sectional Belt Conveyor

STEPHENS-ADAMSON MANUFACTURING CO., Aurora, Ill., has brought out Saco sectional belt conveyor components, a complete set, pre-engineered for assembly. The units are designed for lengths up to 50 ft., and from 51 through 100 ft. in both 18 and 24 in. belt widths. Capacity for the 18-in. belt is 150 t.p.h., and for the 24-in. belt, 250 t.p.h. The components include the S-A 745 carrier and return roll, head and tail pulley assemblies, drive assembly, roller type holdback, spring type belt cleaner, bent plate decking, belt and Swivelpiler for extending storage area at conveyor discharge. Either a Saco speed reducer drive with an overhead motor mounting or a shaft-mounted reducer is available. The components are avail-

able for a complete conveyor installation or as repair or replacement units on existing conveyors.



Vertical Speed Reducer

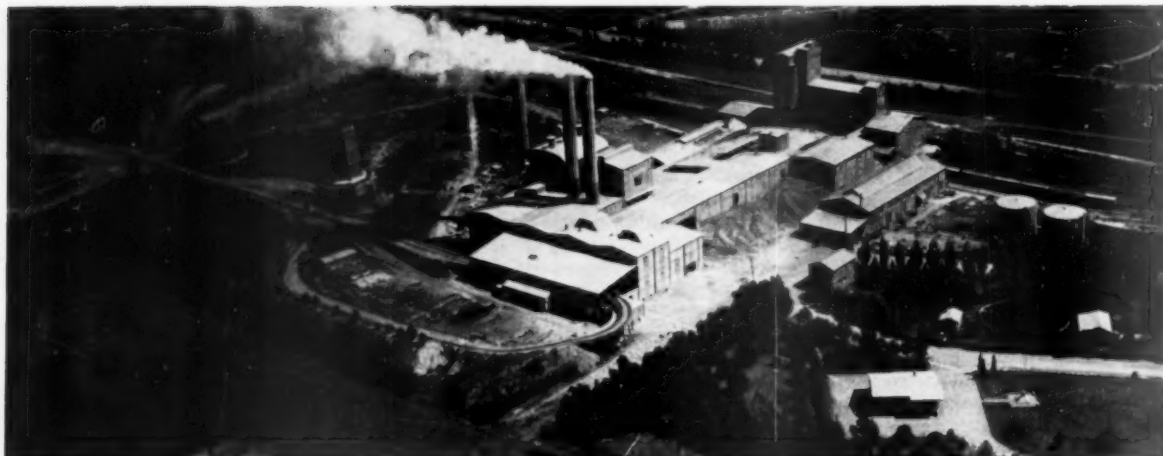
THE AMERICAN PULLEY CO., 4200 Wissahickon Ave., Philadelphia 29, Penn., has announced a complete line of Shaft-King shaft-mounted, speed-reduction drives for vertical mounting. The reducers feature helical gears of alloy-steel forgings, and both ball and tapered-roller bearings are used. A three-wall internally-ribbed cast-iron housing which is said to provide permanent gear and bearing alignment is also featured, as well as an extra-large oil reservoir and a patented concentric-shaft design. The units can be supplied with a torque-arm overload release for protection of the driven machine, motor and drive, against jam, choke or shock loads.

Hardsurfacing Alloys

COAST METALS, INC., Little Ferry, N. J., has announced a bare rod for gas welding, designated No. 18, and a coated rod for arc welding, or in cast form, made to order to the customers' specifications, which is designated No. 118. The metal is composed of a chrome, nickel, cobalt and moly alloy, and has a melting point of 2330 deg. F. A folder is available from the company describing the chemical and physical properties of the metals.

Coated Multiwall Bagging

ARKELL AND SMITHS, 1000 Mill St., Canajoharie, N. Y., has developed a sheet coated with "Poly-Kote," a combination of polyethylene and wax, for use in multiwall bags. The coating is said to be equally resistant to acid and alkali as straight polyethylene, and also to be suitable for packaging hydroscopic materials; such as resins, chemicals, fertilizers, etc.



General view of Loma Negra cement plant at Olavarria, Buenos Aires province, Argentine Republic. Annual output is 2,350,000 bbl.

First LEPOL SYSTEM Wet Process Kiln In the World

By JORGE BOISO*

• Loma Negra Cement Co., has placed in operation a 400 ton per day Lepol wet process kiln at its Olavarria, Argentina plant. Filters reduce slurry moisture to 14 percent water in filtered cake which is nodulized and introduced into predrying grate section

In the Argentine Republic, fuel oil is used almost exclusively to fire cement kilns. With over 12 mills in the country, only one, that belongs to the State, operates with natural gas, because it is located on an oil field with

gas as a by-product. In the past year, this plant only produced 8.5 percent of the entire production.

Another small mill is set up to use coal, but fuel oil is preferred. The market price of fuel oil increased

from \$33 (\$6.6 U. S. dollars) national currency per metric ton in 1939 to \$300 national currency (\$60 U. S.) per metric ton in 1953, f.o.b. refinery. This is why all technical efforts have been directed to reduce fuel consumption which in 1951 was 18 percent per ton of cement, for all mills, with relation to clinker production.

Loma Negra, S.A., is one of the most important cement producers in the Argentine Republic, and its Olavarria plant operates four wet process rotary kilns (three Polysius and one Krupp) with a total capacity of 1250 metric tons in 24 hr. (7300 bbl.). In 1947, research was started, looking to the possibility of producing portland cement by the wet process but with a lower fuel consumption.

Loma Negra decided to continue the wet process method because existing installations were wet process, and to change and rebuild some parts of the mill to dry process would have been expensive and difficult while continuing production. The management is convinced that the wet process improves homogeneity which permits



Inside firing hood. Note point of clinker discharge

*Sr. Ing. Loma Negra S.A. — Compania Industrial Argentina, Buenos Aires, Argentina.



Above: Set of three filters with belt conveyor to carry slurry cake to nodulizer installation



Right: Exterior view of the Lepol grate with the filters on top

feeding kilns with uniform mixtures of constant characteristics, and also obtain high quality clinker. Handling raw material by the wet process is always simpler and involves less dust loss. The original idea belongs to Dr. J. J. Becker, technical director of Loma Negra, and was worked out with the invaluable cooperation of Dr. Otto G. Lellep, inventor of Lepol system. The following objectives were set out:

1. Demonstrate the possibility of using a Lepol grate, starting with a raw cement mix in the wet process.
2. Obtain from the Lepol grate the highest possible thermal efficiency.
3. Possibility of using through research the raw materials available in the Loma Negra quarry.
4. Laboratory tests and pilot plant.
5. Complete design for a wet process Lepol system kiln for 400 to 500 metric tons in 24 hr.

LOMA NEGRA RAW MIX BASIC ANALYSIS

	Percent
CaO	42.27
SiO ₂	14.70
Al ₂ O ₃	2.82
FeO ₂	1.98
MgO	1.25
c.l	36.63
CaCO ₃	78.00
H.M.	2.16
S.M.	3.06
Standard Cal	92.60

ess Lepol system kiln for 400 to 500 metric tons in 24 hr.

Research Program

The first question was to establish that, from the raw mixture, it would be possible to obtain nodules from 10 to 15 mm. in diameter, exactly the same size obtainable by the dry process. This is fundamental because the Lepol travelling grate can only work

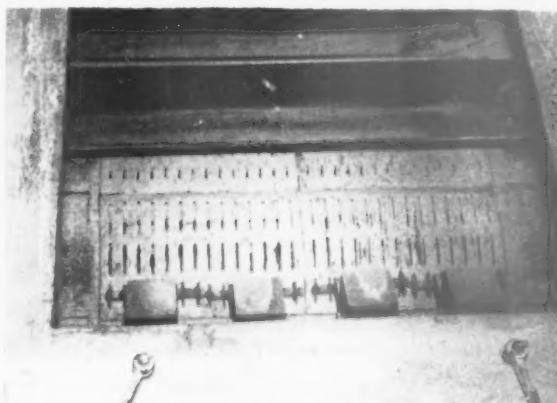
right and efficiently when it carries nodules having a physical consistency and the right size to allow the gas passage through the bed of nodules.

The problem of obtaining small pellets of semi-solid raw cement material, with the minimum possible amount of water for high thermal efficiency, has been solved by studying the different methods of removing the water from a raw cement mixture. One of the well-known economical methods of removing liquids from a solid mixture, in a liquid, is by filtration. Loma Negra already had vacuum filter installations for slurry production that reduced a semi-solid slurry to 19 percent water that started with 35 percent water.

Dr. Lellep's exhaustive studies of filtration finally resulted in obtaining



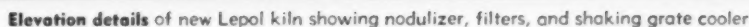
Left: Interior of nodulizer showing the roller scraper with knives to scrape slurry from the plate. Right: One of the links of the travelling Lepol grate. Note scraper that regulates the thickness of the bed of nodules



For a better understanding of this part of the research, it is well to remember that in a long rotary kiln there are three different zones of heating: (1) drying raw cement mix up to 250 deg. C. (480 deg. F.); (2) preheating and calcination chamber between 250 deg. and 1100 deg. C. (480 deg. - 2010 deg. F.); and (3) the fusion point in the kiln, between 1400 deg. and 1500 deg. C. (2550 deg. - 2730 deg. F.). In the common Lepol system these three zones are well defined: (1) the drying chamber with temperatures up to 250 deg. C. (480

Finally, Dr. Leliep's research at the Loma Negra pilot plant consisted in the determination of speeds, pressures,

Beginning from the top, the equipment includes three Feine string-discharge filters, equipped with oscillating agitators and "flappers." These units produce a filtered cement slurry cake with 14 percent water. Two work simultaneously, with the third unit as a spare filter. Each filter has a filtration surface of 40 sq. m. (47.8 sq. yd.). Experiments in operation have determined that the most convenient thickness of the cake is 10 to 12 mm. ($\frac{3}{8}$ to $\frac{1}{2}$ in.). A belt conveyor below removes the cake and also catches fallen dust collected from the smoke stack boxes of the other kilns. This prevents pieces of cake from sticking on the belt and adhering to each other. A roller studded with spikes breaks the cake in small pieces as they discharge to a rolling drum, called the nodulizer. In the drum, the caked material is subjected to a spray



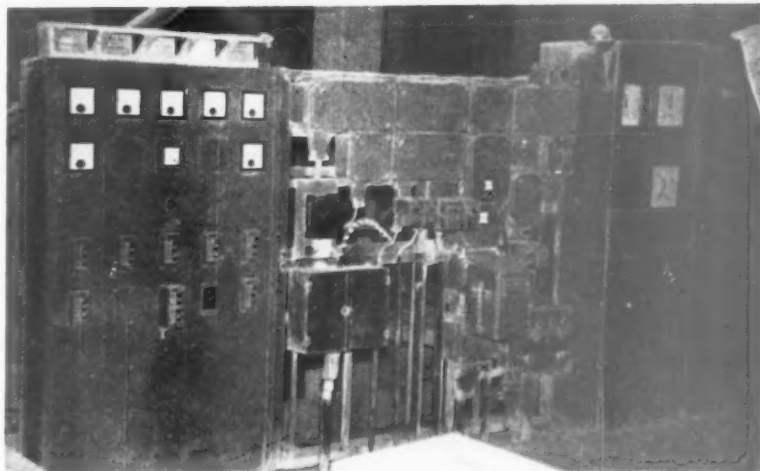
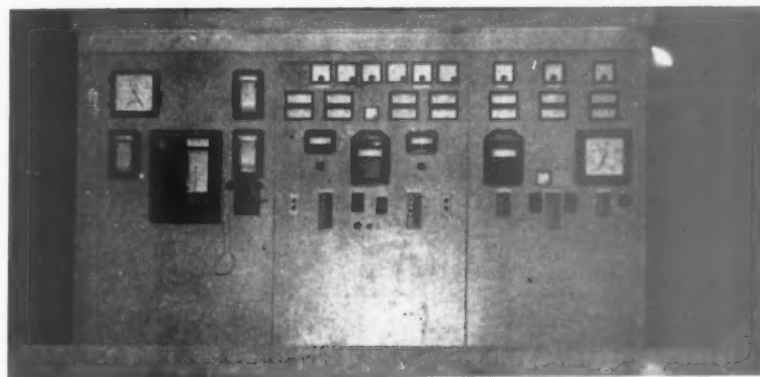
of water or hot air, in accordance with the conditions of the broken cake, which forms into the homogeneous small balls or nodules, of a diameter between 8 to 12 mm. ($\frac{3}{8}$ in. to $\frac{1}{2}$ in.). An effort is made to avoid producing nodules too small. A roller scraper with knives helps to keep the inside of the nodulizer clean. A belt that moves from side to side on a circular sector of about 90 deg. distributes the nodules on the grate feed hopper and a scraper on the travelling grate makes a bed of 16 to 20 mm. ($\frac{5}{8}$ to $\frac{3}{4}$ in.); preferably less than 20 mm. to prevent too much obstruction for the passage of hot gases.

The grate body is lined with refractory brick to make it dust proof. Inspection doors along the grate permit checking operation.

Fan No. 1 drives the hot gases from the kiln, first through the discharge tube to the hot chamber from which fan No. 2 drives the gases through the drying chamber. In this way the grate system gets maximum use of the hot gases, avoiding cold air in the drying box, thereby wasting heat.

The grate and the rotary kiln are connected by a ring with counterweights to make a hydraulic seal. Travelling nodules from the grate pass to the rotary kiln, of 1 $\frac{1}{8}$ -in. welded plate, 40 m. (131 ft. 5 in.) long by 3.60 m. (11 ft. 8 in. dia.) with two riding rings and a dust-proof firing hood. The clinker falls to an air-quenching type shaker cooler that operates in a direction opposite to the grate with a flow of cold air induced by a 125-hp. fan (No. 1). The cooler is supported by a concrete foundation.

The guaranteed production of 2315 bbl. has been fulfilled. Fuel consump-



Above: Main electrical control panel for new Lepol kiln. Below: Secondary control panel to regulate the travelling grate

tion in the experimental period has been between 1010 and 1030 calories per clinker kilogram. The quality of the clinker is excellent.

CLINKER ANALYSIS

	Percent
CaO	66.68
SiO ₂	23.24
Al ₂ O ₃	4.54
Fe ₂ O ₃	3.06
MeO	1.99
c.l.	0.08
H.M.	2.16
S.M.	3.06
Standard Cal	92.34

No special difficulties were experienced by the operating staff, remembering that it is a team whose experience covers a 25-year period, producing 400,000 metric tons portland cement (2,350,000 bbl.) yearly. Principal attention is paid to the grate, avoiding dust that could clog the grate plates. Care is also taken to avoid excess water so the raw material does not get sticky; also the operators are very careful to avoid mixing cold air with the circulating gases.

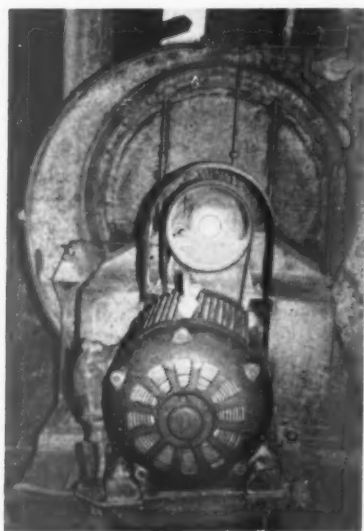
The flame from a fuel oil pressure burner, must be kept short, its gravity center as near as possible to the center of clinker-forming zone.

This system inaugurates a new method of wet process manufacture of

portland cement with a fuel consumption that can be compared with the dry process.

World's Largest Clamshell

APPEARING in a recent issue of *The Marion Groundhog*, published by Marion Power Shovel Co., Marion, Ohio, was an interesting description of the Marion 7400 clamshell, built for the Bunnell, Fla., plant of Lehigh Portland Cement Co. The 9 $\frac{1}{2}$ -cu. yd. clamshell, believed to be the world's largest on a long boom, swings from the end of a 175-ft. boom on a Marion 7400 walking dragline, rehandling coquina shell used by Lehigh in the production of cement. The clamshell relays the material from a stockpile to a hopper that starts the shell on its way through the processing plant. The unusual range of the boom enables it to cover a wide stockpile area in servicing the conveyor hopper. It reportedly handles a load equivalent to two fair-size truckloads, swings it almost a city block and could dump it on top of a 7-story building. According to Marion officials, its size was needed to meet the requirements of the Lehigh plant.



Exhaust fan (No. 1) on Lepol grate with a double gas flow



AUTOMATIC CONTROLS In Newest

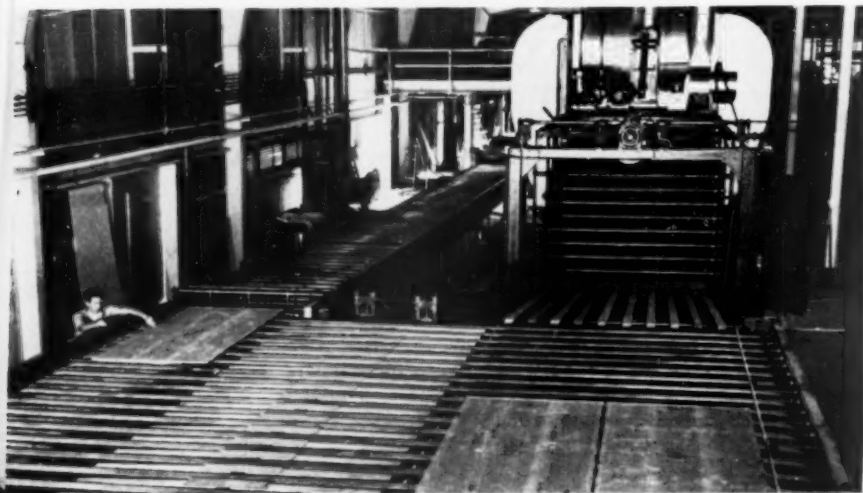
DURING MID-SEPTEMBER, the Kaiser Gypsum Co., Inc., placed in operation in Seattle, Wash., its new and modern gypsum plaster and wallboard plant. The opening day, September 17, was in effect a "Henry J. Kaiser Day" in Seattle. Official ceremonies

included a press breakfast with representatives of the leading industrial magazines of the United States and newspaper men of the Northwest in attendance with Turner Barton, advertising manager for Kaiser Gypsum Co., Inc., as master of ceremonies. Carl R.

Olson, Wallace A. Marsh, and Claude E. Harper, all top flight officers of the Kaiser Gypsum Co., Inc. were at the head table. Henry J. Kaiser was the main speaker and answered questions from the floor. At noon Mr. Kaiser addressed a record breaking crowd at the Seattle Chamber of Commerce luncheon, and that afternoon closed the switch that placed the new multi-million dollar wallboard and plaster plant in operation. At the latter ceremonies, bus transportation was provided for anyone wanting to make the trip, and a large number took advantage of the opportunity to see the plant. Radio and TV technicians were present as well as press photographers, reporters, etc., so that the citizens of the Northwest might know about the new giant industry in their midst.

With the opening of the Seattle plant, Kaiser Gypsum Co., Inc., has become one of the largest gypsum companies in the West, and currently supplies about one-fourth the gypsum

Transfer table, foreground, reverses direction of travel of the "green" boards, and automatically feeds them to the dryer. Part of the roll assembly in foreground is to turn boards over so that the finish side will be up

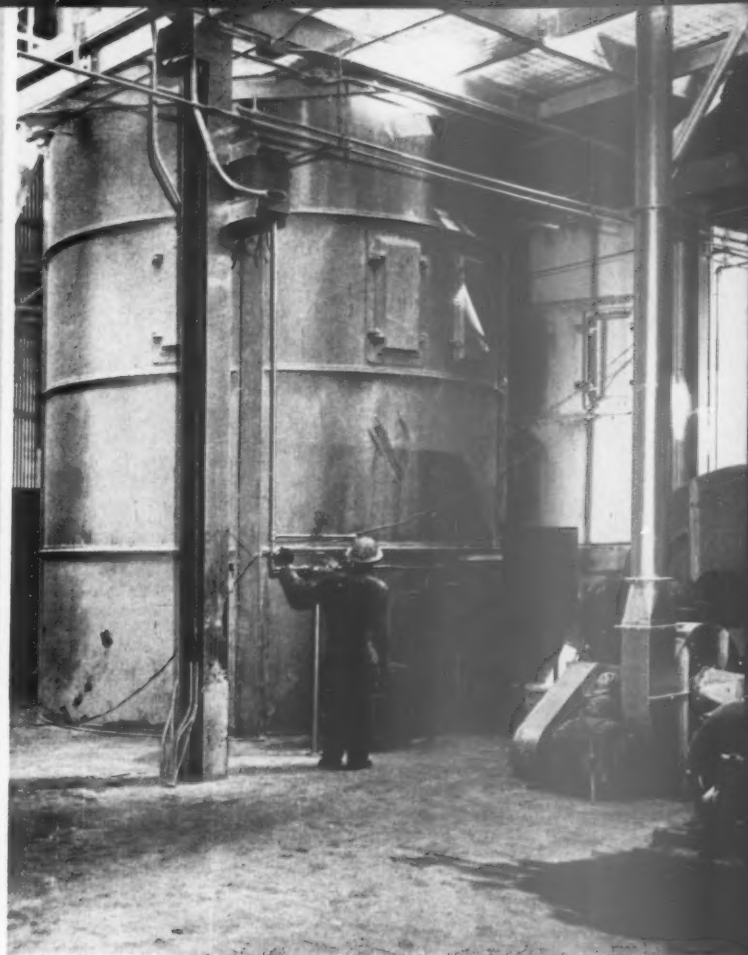


• Kaiser Gypsum Co., Inc., Seattle, Wash., plant has annual capacity of 100 million sq. ft. of 3/8-in. gypsum board products and 35,000 tons of plasters. Precision, automatic weighing controls for materials are an outstanding feature of plant

By WALTER B. LENHART

Left: New Kaiser Gypsum Co., Inc., plant in Seattle, Wash., is adjacent to the Permanente Cement Co. silos. In the background may be seen the belt conveyor system for unloading gypsum rock. The dome-shaped building is a storage (surge) pile for raw rock. Identification of structures follows: (1) Glacier Sand and Gravel Co., (a Kaiser subsidiary); (2) Permanente Cement Co. silos; (3) oil storage; (4) gypsum calcining building; (5) wallboard plant; (6) shop, warehouse, change room; (7) Kaiser Gypsum Co. office; (8) Permanente Cement Co. office

Right: One of two 16-ton calcining kettles fired by an oil burner



Gypsum Plaster and Wallboard Plant

products used in the seven western states (Oregon, Washington, California, Arizona, Utah, Idaho and Nevada). In this area are eight other gypsum plants manufacturing wallboard.

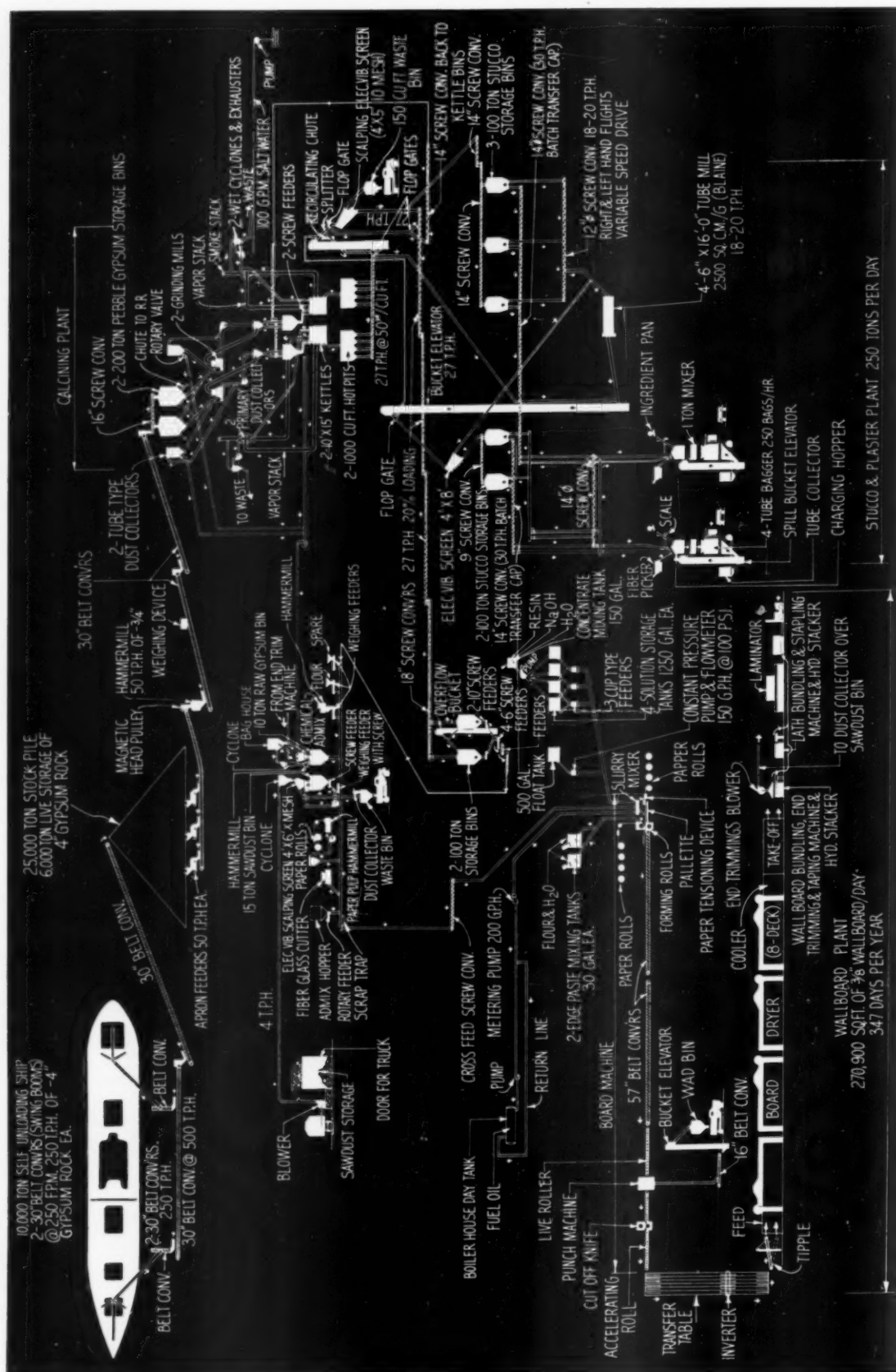
The new plant located in the 5900 block on E. Marginal way has an annual capacity of 100,000,000 sq. ft. of 3/8-in. gypsum board products and 35,000 tons of hardwall and other types of special gypsum plasters. The board products will include: plain, perforated, and long gypsum lath; 1/4-in. to 3/8-in. gypsum wallboard; plain and impregnated gypsum exterior sheathing. Territories served by the new plant include Washington, Oregon, Idaho, and Alaska. All products from this plant, and all the other company-owned gypsum plants are marketed under the name of "Kaiser Hardwall Plaster," "Kaiser Gypsum Lath," "Kaiser Gypsum Wallboard," etc.

The plant is immediately alongside the Seattle distribution yard of the Permanente Cement Co. where water-

borne bulk cement carriers unload to a bank of silos on the docks. The offices, including one of the ready-mixed concrete batching plants of the Glacier Sand & Gravel Co., are also adjacent to the new wallboard and calcining plant. Glacier Sand & Gravel Co. is a totally owned subsidiary of Permanente Cement Co. which in turn is a part of the Kaiser interests. Kaiser Gypsum Co., Inc., is also 100 percent owned by Permanente Cement Co.

The plant site covers 9 1/2 acres along the Duwamish Waterway. Construction of the \$3,250,000 plant was completed in a record smashing time of eight months. The project involved five major buildings plus auxiliary buildings for the plant. Some 1200 pilings, driven to a minimum depth of 30 ft., were involved. About 4000 cu. yd. of concrete was used along with roughly 1000 tons of structural steel. About three acres of ground are covered. The plant will employ 170 men and will have an annual payroll of about \$750,000.

Kaiser Gypsum Co., Inc. is the outgrowth of the purchase in 1948 of the Standard Gypsum Co., Inc., which had holdings in Long Beach, Calif., and in Nevada. At the same time the Kaiser interests took over the Compania Occidental Mexicana, S. A., its subsidiary which operated gypsum quarries on the island of San Marcos in the Gulf of Lower California. The Long Beach plant was immediately rebuilt and a modern wallboard plant placed in operation. This plant was described in ROCK PRODUCTS, September, 1947, p. 74. In 1949 the Kaiser group took over the gypsum plant operations of the old Pacific Portland Cement Co. with a wallboard plant at Redwood City, Calif. During 1950, Gypsum Carrier, Inc., was formed as a wholly owned subsidiary to operate ships to transport crude gypsum from San Marcos island to production plants on the West Coast and abroad. In addition to tonnage hauled to the plant, considerable tonnage of crude gypsum was shipped to Japan, the Philippines





Ships deliver raw gypsum at this dock section, transferring material to the 30-in. belt conveyor at 500 t.p.h. for movement to the covered storage pile. There are two unloading stations

and other Pacific areas where the materials are used as a retarder in the manufacture of portland cement and for other gypsum products where the future market appears to be very favorable.

Mining and Crushing

San Marcos Island is 12 miles east and offshore from Santa Rosalia, Baja California, and west of Guaymas on the mainland of Mexico. The island has modern dock facilities with a deep water harbor capable of handling the largest ore-carrying ships on the Pacific Ocean. The deposit is the only one on deep water on the Pacific Coast, and is one of two for the entire North American continent that is on tidewater.

The deposit on San Marcos Island is one of the world's largest and purest. The company has well over 200,000,000 tons of pure gypsum available as well as large deposits in Nevada near Yerrington, Gerlach, and Las Vegas. These latter deposits can be a source of raw material should anything disrupt San Marcos deliveries. However, the San Marcos deposit is large and, with practically no overburden, it will supply for many decades coastal areas contiguous to the Pacific.

Gypsum rock at San Marcos ranges between 96-98 percent gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$). The rock is predominantly white and above average in hardness and virgin strength. Gypsum producers have long said that "The harder the rock — the harder and stronger the products are that are made from that rock..." So with that in mind, San Marcos raw material is an exceptional one. Even though the raw material is harder than average, due to the lack of impurities in it, crushers, hammermills, and grinding units show exceptionally small amounts of wear. At the Long Beach operation a Pennsylvania hammermill, after 28 years of continuous service, showed

so little wear that experts estimated that in another 72 years the hammers "might" need replacing. Raymond Roller grinding mills showed similar infinitesimal wear after over 25 years of use. Experts in the rock processing field have expressed the view that possibly no other material taken from the earth's surface can equal a record like this. These same experts feel that most of the credit for this record is due to the inherent properties of the raw rock-purity.

At the San Marcos deposit, open pit mining, using high capacity power shovels and trucks, is featured. The rock is crushed to minus 4-in. and stored in a surge pile holding 20,000 tons with a reclaiming belt conveyor under it. Boat loading facilities include a long belt conveyor system that delivers the crude rock direct to the ship's hold at a rate of 400 t.p.h. Plans are currently underway to revamp the San Marcos set-up to get higher tonnages more economically.

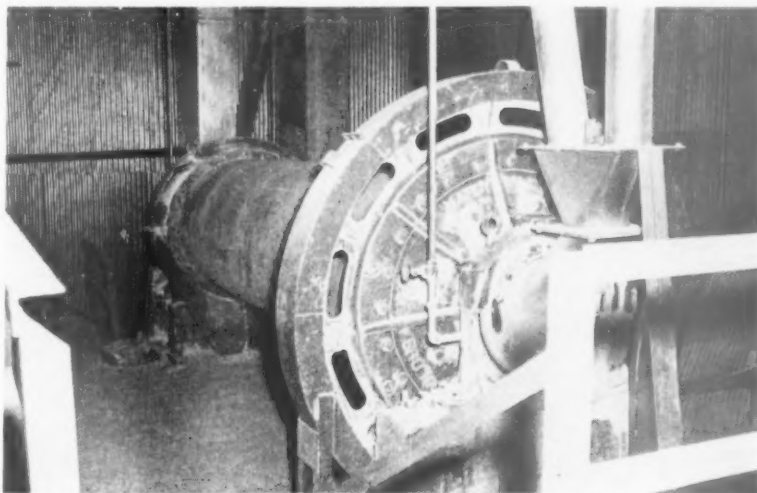
For water transportation of the rock, a chartered Liberty ship is cur-

rently being used as the company's 10,000 ton S. S. Harry Lundeberg was lost off the coast of Baja, California, during February of this year (1954). The cement carrier S. S. Permanente Silverbow, one of the Permanente Steamship Corporation's ships has also hauled some crude gypsum.

Self-unloading Gypsum Ship

However, a new large capacity, ocean-going ship is now being converted. It will be a completely self-unloading and self-cleaning unit, having the main belt conveyor in the lower hold of the boat with adequate ore chutes delivering to the main belt. On the deck will be a single belt conveyor arranged so that when the boat is on the high seas the conveyor will be lashed parallel to the deck. At the unloading site, the swinging conveyor booms will pivot out to an unloading hopper on the dock. The boom conveyor will unload at the rate of 750 t.p.h.

At the new Seattle plant, the receiving hopper delivers to a main off-



A 4½- x 16-ft. tube mill for stucco mill grind. Feed is 85 percent 100 mesh and production is at the rate of 18 to 20 t.p.h. to a fineness of 2500 sq.cm./gr.



Henry J. Kaiser, head of all the Kaiser industrial enterprises



E. E. Trefethen, Jr., executive vice-president, Henry J. Kaiser Co.



Edgar F. Kaiser, president, Kaiser Motors Corporation

bearing belt conveyor, designed to work into the general pattern of ship unloading using the self-unloading boat. Currently, cranes equipped with clam-shell units are used to unload the cargo charter vessel; however, the S. S. Permanente Silverbow has automatic discharging equipment with men working in the holds for clean-up purposes. The new ship, which is expected to be in service early in 1955, will be an important factor in low cost water transportation of the crude rock.

The Seattle plant was designed by Kaiser Engineers Division of Henry J. Kaiser Co., Oakland, Calif., under the direction of George Havas, vice-president and general manager of the engineering organization. Others in the

engineering company who participated in designing the plant and supervising its construction were L. H. Oppenheim, vice-president and assistant general manager; Einar Larsen, vice president and manager of engineering; Harry J. Bernat, chief project engineer; Don Daly, project engineer; and Fred W. Wright, resident engineer at the construction site.

The prime contract for the construction went to the J. C. Boespflug Construction Co., Seattle, Wash., which submitted the low bid of \$1,709,762 for the buildings and installation of equipment. Nearly 100 subcontractors and suppliers of materials were involved in the project.

In lay-out, the plant consists of a belt conveyor unloading system; a

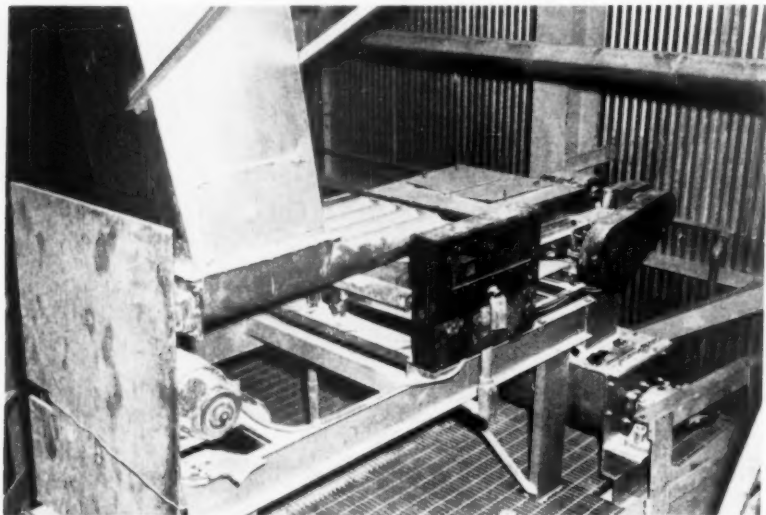
covered, 25,000-ton capacity storage building for the crude rock; a calcining building that is 80- x 129-ft. and eight stories high. The wall-board building is two stories high and 155- x 600-ft. The machine shop, warehouse and employes' change house are grouped in a single one-story building 103- x 109-ft., with a neat and modern design office and administrative building immediately alongside. Ample paved parking area is available inside the high steel fence around the plant.

Oil for the dryer, steam boilers, kettles, etc. is stored in a 200,000-gal. steel storage tank surrounded with a heavy reinforced concrete retaining wall that has ample capacity to hold at least 250,000 gal. Nearby is a Foamite installation for added fire protection.

To those passing the plant, the dominant feature of the installation is the unique covered storage building for the crude rock. It is a dome-shaped structure unobstructed by any interior supports. It is 175 ft. in diameter and seven stories high. A long belt conveyor delivers the rock to the apex of the dome where the material unloads to form a single conical pile. The live storage capacity is 6000 tons; total 25,000 tons. The structure is fabricated of steel and covered with metal siding. Actually the building is a 16-sided structure.

Calcining Plant

The main elements of the calcining plant include a Pennsylvania hammer-mill that reduces the minus 4-in. crude rock to $\frac{3}{4}$ -in. Ahead of the crusher is a Dings magnetic head pulley to remove tramp iron, and following it



Looking down at the four 6-in. screws ahead of the weighing feeder for stucco. Over-flow goes to bucket elevator for return to bins



Sam R. Witt, Jr., superintendent, Kaiser Gypsum Company's Seattle plant



Left to right: Claude E. Harper, vice-president and general manager, Kaiser Gypsum Co., Inc.; **Wallace A. Marsh**, vice-president and general manager, and **Carl R. Olson**, vice-president, Permanente Cement Co., owner of the gypsum company

is a Merrick Weightometer to obtain accurate weights of raw material going to the bins which feed the two high side Raymond mills. The Raymond mills are equipped with Raymond whizzer air separators and have bag filters on the vents. Calcining is done in two 10- x 13-ft. Ehram kettles fired by oil burners. A 4½- x 16-ft. Marcy tube mill, which regrinds stucco for the hardwall market, operates in closed circuit with a Hummer screen.

The boom conveyors on the self-unloading ship will unload to a steel receiving hopper. The hopper serves belt Conveyor No. 3, a 30-in. unit, and will handle 750 t.p.h. All belts in and ahead of the calcining plant for transportation of materials were supplied by the American Rubber Co. They ride on Chain Belt Co. (Rex) idlers. Belt No. 3 unloads to the inclined long belt conveyor, serving the storage pile. All conveyors are covered with a neat tubular-shaped corrugated iron housing.

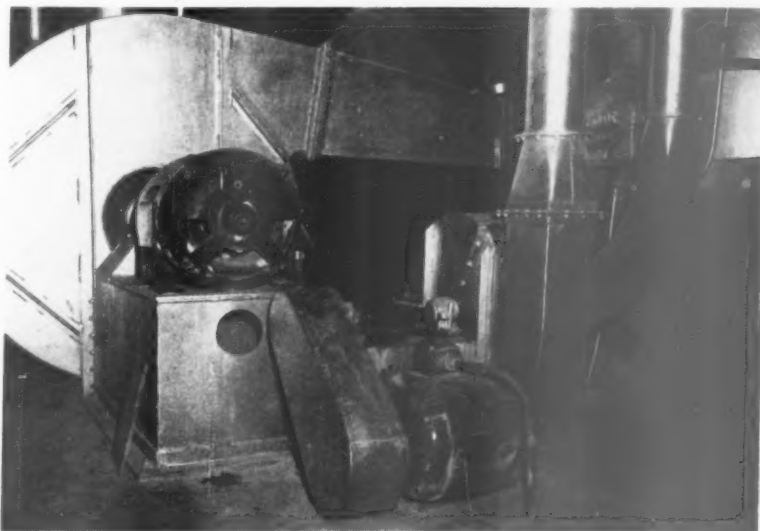
Withdrawal from the surge pile is by means of three 24-in. Jeffrey apron feeders, each of which has a capacity of 50 t.p.h., and they are 8 ft. long, center to center of shafts. They are each driven through Falk speed reduction units. One feeder only will be operated at a time. The apron feeders unload to a 30-in. tunnel belt conveyor that delivers to the 30- x 24-in. Pennsylvania hammermill driven by a 75-hp. Crocker-Wheeler motor. The hammermill, which has a capacity of 90 t.p.h., discharges to a second inclined belt conveyor over which is the Merrick Weightometer recording device. This belt unloads to Belt conveyor

No. 7, a 30-in. unit, that delivers in turn to a 16-in. screw conveyor over two, 200-ton capacity pebble gypsum silos. (All crude is figured at 90 lb. per cu. ft.) Material in these bins is the feed to the two Raymond mills that each have a capacity of 11.5 t.p.h., grinding 85 percent minus 100 mesh. Ground material from the air separator, moves via a 14-in. reversible screw conveyor to two steel, hopper-bottomed bins over the kettles.

Means have been provided for a fan to take the dust from the bag filters (on the Whizzer air separators), and deliver the finely ground raw gypsum to the wallboard plant where it is used as an accelerator for the plaster

used in wallboard or lath. The fan on this unit is powered by a U. S. motor. In addition finely ground raw gypsum can be taken direct from one of the silos over the kettles in the event that the bag collectors do not yield a sufficient supply.

The kettles, which hold 16 tons each, are steel-jacketed, and have bottoms of one-piece, pressed steel. Each kettle has the conventional stirring mechanism and rabble arms. Due mainly to the rapid removal of water of crystallization from the calcining mix resulting in a boiling action, a 25-hp. motor suffices to drive each kettle assembly. Each kettle is fired by a Hauck oil burner using a small,



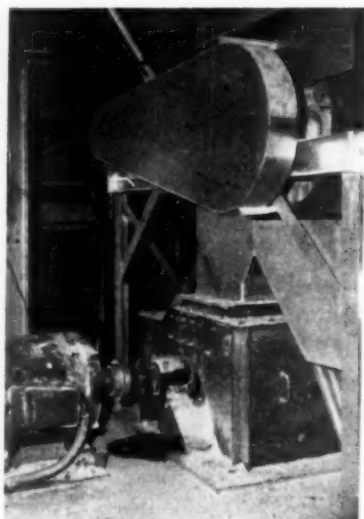
Motors and fans for raw fine grinding (two) mills. Fan in foreground delivers finely ground gypsum to the wallboard plant to be used as an accelerator

low pressure fan driven by a General Electric motor. Using fuel oil in this type of operation for calcining permits a simple means of controlling the temperature of the calcining material. Fuel consumption, in gallons per ton, is a very minor figure.

Each kettle is fed by a short screw conveyor with individual Bristol recording pyrometers used by the "calciner" to control the calcining operation. A 2¼-hr. cycle is practiced with the stucco dumped at 350 deg. F.

An Ehrsam cyclonic-type dust collector on each kettle recovers most of the dust, dry, and it is returned to the kettles continuously by gravity. However, on the roof are two wet dust collectors using sea water to clean up the exhaust gases completely. These dust collectors were developed at the Long Beach operation and are quite unique: After a lot of costly experimental work collecting this type of dust, it became apparent that the material to be caught was not a dust at all, but a finely divided mud in suspension. The final collector evolved as a cyclone about 8 ft. high and 4 ft. dia. with a high speed fan on the exhaust side of the collector. The stream of kettle gases enter the collector tangentially and the particles of mud [in suspension] impinge against the side of the collectors where water sprays wash the material to waste. The Seattle collectors are made of steel although copper has been used at the Long Beach plant quite successfully where this type of cyclone lasted 10 years or more. There is no dust evolved from the Seattle kettles and even the steam is so small in amount as to be negligible. The original dust collectors of this type were the brain child of William Senseman, western representative of Pennsylvania Crusher Co. and Wallace Riddell, chief consultant for Kaiser Gypsum. The writer was superintendent of the Standard Gypsum Co.'s Long Beach plant at that time, and had a finger in working the "bugs" out of the unit. Mr. Riddell is the only staff member now with Kaiser Gypsum Co., Inc., who was a part of the original Standard Gypsum Co. Mr. Riddell is well known as a national authority on gypsum and its products.

The kettles unload to individual steel hot-pits that hold 1000 cu. ft. of stucco (50 lb. per cu. ft.). These are hopper-bottomed and have four, small diameter unloading screw conveyors per hot-pit. These eight screws unload to a 14-in. dia. master screw conveyor that has a capacity of 27 t.p.h., and can go direct to one of two bucket elevators erected side by side. The two bucket elevators are interchangeable with adequate by-passes, conveyor systems, etc., to continue



A 75-hp. motor drives hammermill. Magnetic separator is on head pulley of belt conveyor feeding mill

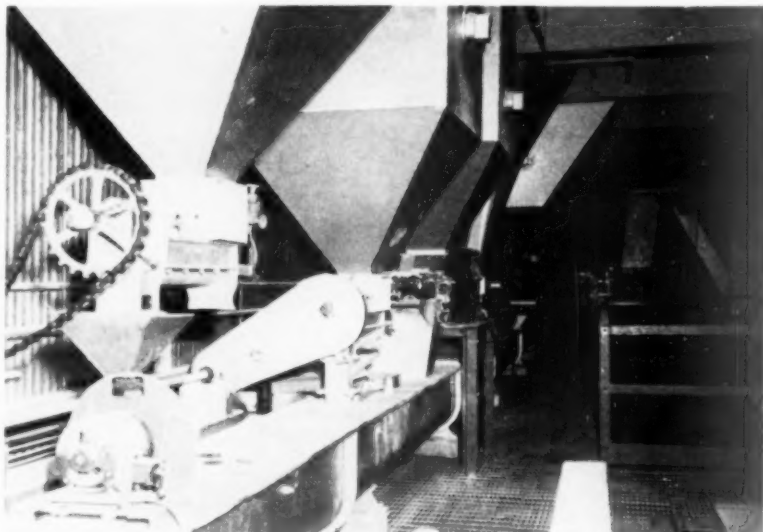
operations should any segment ahead, or following, an elevator fail. One elevator delivers the stucco to a 4- x 5-ft. Hum-mer screen equipped with 10-mesh wire. It is essentially designed to take out any foreign matter in the stucco that might have accidentally found its way into the system. Plus from the Tyler screen falls to a 150-cu. ft. bin where trucks can receive the material and haul it to waste. Fines from the Hum-mer can go two ways: to the wallboard plant via four (in series), 18-in. dia. screw conveyors that have a capacity of 27 t.p.h. at 20 percent loading; or, to the raw stucco bins for eventual production of the sacked gypsum products, hardwall, etc. The screen can be by-passed and the stucco sent direct to the screw

conveyors serving the wallboard plant, or, the stucco can by-pass the Hum-mer and go back to the feed bins ahead of the kettles.

There are three 100-ton capacity raw stucco bins filled by 14-in. dia. screw conveyors. The three hopper-bottom bins can unload to a 12-in. conveyor that has a right and left hand flight and is driven by a variable speed motor at 18 to 20 t.p.h. This is designed to feed the Marcy tube mill that is loaded with 5 tons of 1-in. steel balls. The tube mill grinds the stucco to a surface area of 2500 sq. cm. per g. Regrinding in a tube mill is said to add plasticity to the material for the fibered hardwall market and it slows down the "ageing" of these types of plaster. The tube mill, rated at 20 t.p.h., uses a 75-hp. motor.

The Marcy mill product goes to the second bucket elevator, previously mentioned, which discharges onto a 4- x 8-ft. Hum-mer screen that has .023-in. openings in its wire deck. The screen operates in closed circuit with the tube mill. Stucco from the three bins can by-pass the Marcy tube mill and go direct to the sacking and mixing section by a series of screw conveyors. Throughs from the Hum-mer in the re-grinding section go to one of two 100-ton capacity finished stucco bins ahead of the mixers.

There are two Ehrsam, paddle-type mixers installed, complete with weighing devices, fiber pickers, etc., but only one mixer has a packer under it. The packer is a four-tube St. Regis unit. Later a second packer will be installed. Mixing and sacking is a compact, dust-less operation with dust collected by a battery of Reese Blow Pipe dust collectors. These collectors, which are of the tubular type, unload to a small



In the foreground is a hammermill to grind admix preceded by volumetric feeder and in the background is one of three weighing feeders. The conveyor, below, feeds the mixer

bucket elevator which also picks up the spill from the packer and returns it to the mixer.

The weighing ahead of the mixer is automatic with the system built around a one-ton weighing hopper and Fairbanks Morse scales. Retarder, or similar ingredients are weighed in a small separate scale-hopper mounted over the larger weighing hopper, and it is so installed that the large hopper cannot be dumped until the retarder is in its weighing hopper. Then when the operator dumps the large hopper the retarder automatically follows. This system was developed by J. B. Ehram & Sons. By having a retarder weight set-up as above outlined, one of the bug-a-boos of the industry is removed—that of not having retarder in hard-wall (or similar plasters), for without the retarder the plaster would set in the mixer in a matter of minutes. This

is only one of many innovations in the new plant that insure a continuous high quality material. Fiber is shredded direct to the mixer. The shredder has an exceptionally long feed snout. This is a safety precaution that insures the mixer operator of not getting his hand into the high speed, disc-type shredder. As the disk has considerable suction, the long feed snout is practical. Mixing time is usually 3 min. or longer.

Material as sacked is hand trucked to freight cars that are spotted on a covered railroad track between the calcining plant and the wallboard plant. Cars are shifted on the track by a power winch (car puller). A large floor space is also available for storage of sacked material in and near the sacking operation. Truck loading facilities are also available for the sacked products.

Under the constant head box are four parallel, 6-in. dia. Ehram screw conveyors, about 3 ft. long and operating in parallel, that deliver the stucco to the Waytrol unit. This is a belt type weight feeder and its rate of feed in pounds per hour is pre-set at the main control board. The Waytrol unit, designated as No. 330, has a rated capacity of 7.1 t.p.h. It is connected to an adequate dust control system. The Waytrol device discharges to Conveyor No. 18. This conveyor might be called the "Master Conveyor" for the wallboard plant for it receives all the dry ingredients going into the finished products, and mixes them thoroughly. This conveyor is several hundred feet long and delivers the dry mix to a cross conveyor ahead of the slurry mixer.

The Waytrol unit for the flour (designated as No. 118) is mounted above the Master Conveyor (No. 18). It is rated at 90 lb. per hr.

Steps In Manufacture

Sawdust is delivered from the outside storage silo by a fan to a small dust collector mounted above a 4- x 6-ft. Hummer screen that has 5-mesh wire. This is designed to take any wood oversize out of the sawdust and any plus material is chuted to a bin where trucks haul the material to waste. The waste bin is also provided with a dust collector on its vent. The throughs from the Hummer fall to a storage silo from which a screw feeder delivers the material to a constant head box with the overflow picked up by a small fan and then returned to a third small dust collector mounted over the main storage bin. The constant head box feeds the Jeffrey-Traylor Waytrol unit which in turn discharges to the master conveyor.

Raw gypsum for use as an accelerator is picked up by the previously men-

Precision Wallboard Manufacture

KEY EQUIPMENT in the wallboard plant includes the Ehram wallboard and lath forming machine, the Coe dryer, and the Jeffrey-Traylor Waytrol weigh batching system for the main ingredients going into the boards. The Waytrol continuous weigh batcher is an entirely new system based on accurate continuous weighings, and the new Seattle plant is believed to be the first wallboard plant in the world to use this system. Not only is it unique but the fundamental change from batching ingredients by volume, as practiced by most of the wallboard plants in the nation, has here been discarded for a more accurate system based on weights.

The Waytrol system is built around a control panel located at a convenient place, and the weights of material in pounds per hour are pre-set and cannot be changed except by the superintendent, or those having authority to make such changes. This insures a uniform and high quality product all the time. It also is designed to use material efficiently and economically.

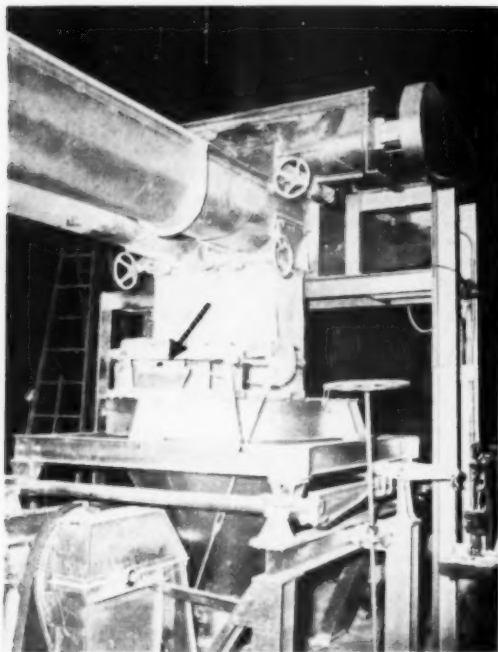
Three of the important ingredients for wallboard and lath are the gypsum stucco, sawdust, and starch. The latter is usually in the form of flour. The amount of flour used is not large when compared to the stucco but the need for accurate control in its use is critical. Therefore in the Seattle plant these three ingredients are weighed separately and continuously by individual Jeffrey-Traylor Waytrol units.

The stucco for wallboard and lath is taken direct from the hot-pits, or "throughs" from the Hummer screen that removes foreign material, or from the by-pass ahead of this screen. Screw

conveyors Nos. 14, 15, 16, and 17 are 18-in. dia. and have a capacity of 27 t.p.h. at 20 percent loading. Operating in series, these conveyors deliver the stucco to two 100-ton capacity coned-bottom stucco silos (60-cu. ft. capacity). At the discharge end of each silo is a large horizontal sliding gate that is ahead of two parallel 10-in. dia. screw conveyors. The screws, driven by U. S. motors, are enclosed in steel pipes of adequate diameter. The two silos are located side by side. The twin screws for each silo converge at a constant head box that is midway between the two bins. The constant head box is mounted over the feeders to the Waytrol device. The head box has an overflow which is operative all the time, and the excess, picked up by a small bucket elevator, is returned to either stucco silo.



Jack Bristol, wallboard plant superintendent



Above: Mixing glue and other liquid ingredients for wallboard

Left: Scales weigh stucco before it goes to the mixer. Arrow points to weighing device for retarder. It is so designed that lower hopper cannot be dumped until the retarder is in its hopper

tioned fan in the calcining building and carried to a dust collector and bin mounted above the master conveyor. Material is received from the main plant at the rate of 2 t.p.h. Provision also has been made to pick up the dust from the trimming saws at the finish end of the Coe drier, and this material is drawn by a fan, to a second dust collector, over the same raw gypsum bin. The trimmer dust is collected at the rate of 100 lb. per hr. The vents of both small cyclones are tied into a tubular bag collector which discharges to the raw gypsum bin. The raw gypsum used as an accelerator (the amount is relatively small) is fed to the master conveyor by a Gump volumetric feeder. This is a screw-type conveyor feeder, supplied by the B. F. Gump Co. The

feeder is rated at 90 lb. per hr.

A dry, crystalline chemical that is also used as an accelerator and hardener is received by another Gump screw-type feeder similar in size to the one previously referred to. This feeder delivers to a Williams "Little Giant," Size 1, hammermill that reduces the water soluble chemical to sufficient fineness. The Williams mill discharges direct to the master conveyor. The mill, which is rated at 50 lb. per hr., is mounted directly on top of conveyor No. 18. The mill is a small unit weighing perhaps 100 lb.

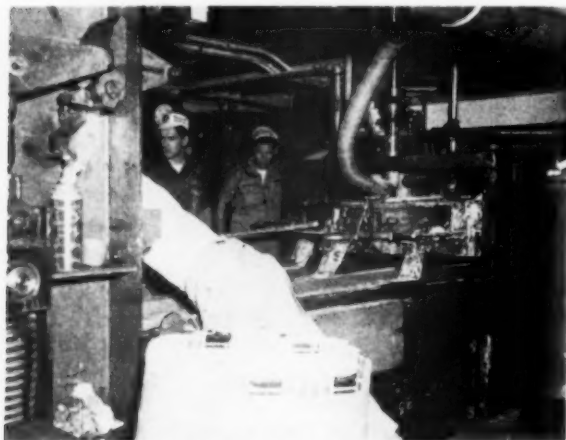
Another inorganic finely divided mineral ingredient is fed from a hopper through a rotary valve that is driven through a Reeves vari-speed drive. This type of feeder is company-assembled, and the only one of its

type used in this section of the plant.

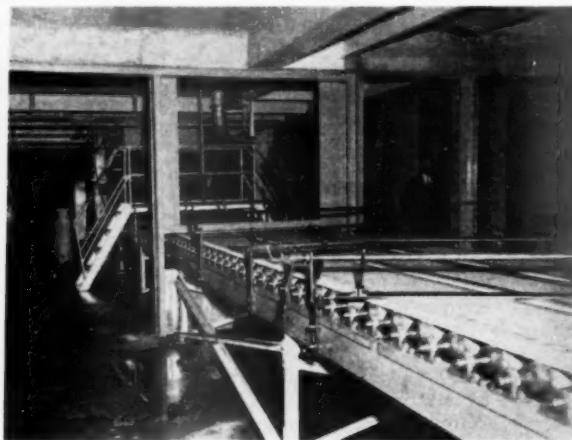
Provisions have been made to feed paper pulp to the master conveyor which will involve the use of a hammermill to disintegrate the waste paper, and a small cyclone. There are two other spare Gump feeders mounted over the master mixer-conveyor.

All the volumetric feeders for dry materials and the cup feeders for the wet materials as well as the three Waytrol feeders are synchronized with the belt speed of the wallboard forming belt. The dry volumetric feeders are all driven from a line shaft that is driven by a vari-speed motor synchronized with the main belt.

Liquid ingredients, glue, etc., are mixed in a section of the plant over the assembly of units previously described. There are three tub-mixers,



Pin type, three-outlet mixer feeds the fast-setting stucco onto board belt conveyor



Edging bars follow the slurry feeders and insure clean, sharp edges to the wallboard or gypsum lath

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Cut-off knife cuts the wallboard to pre-determined lengths in a continuous, automatic operation



End of eight-deck, 295 ft. long dryer. The dryer has a capacity of 250 tons of water per day

each with a "Lightening Mixer" supplied by Mixer Equipment Co. These are a portable type mixers, each driven by its own motor, that are clamped to the side of the tubs. The mixer tubs unload to storage tanks below from which the liquid ingredients are fed to the water line serving the slurry mixer by one of three-cup-type feeders. For mixing the flour for the two-edge paste, there are two similar mixers available. From these mixers the paste is delivered to the forming section of the board machine.

A liquid petroleum product (Bunker Oil No. 3) for use in certain types of water-repellent wallboards is picked up by a small pump and delivered over a pipeline to a metering pump with the excess flowing back to the storage tank. The metering pump, which has a rated capacity of 200 g.p.h., delivers the liquid by pipe to the slurry mixer.

Water for the stucco-mix is received in a 500-gal. capacity float tank served by a constant pressure pump rated at 1500 g.p.h. at 100 p.s.i. This

water goes into the same line as the liquid chemical previously described, and is adequately mixed therewith before reaching the slurry mixer installation.

Board Machine Operation

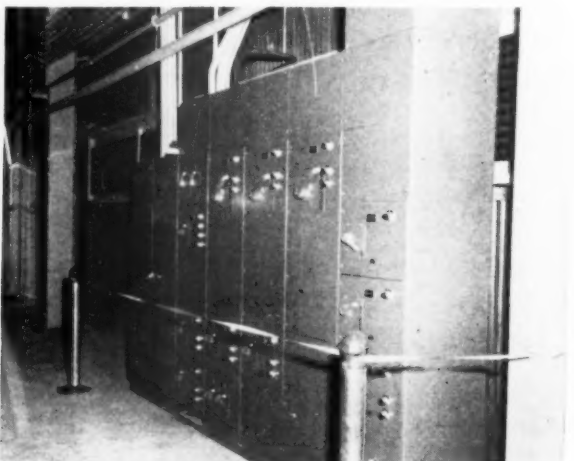
The Ehram board machine includes the pin-type slurry mixer that delivers the pulp to the bottom paper of the wallboard or similar products. Bottom and cover paper are in rolls on tension-controlled racks ahead of the pin-mixer. Following the tension-rolls is a Ehram scoring wheel that is used only on wallboard. It scores the edge of the paper so that it can be neatly folded to make a sharp clean edge in the forming rolls that follow the pin-mixer.

After passing through the forming rolls the green wallboard rides on a flat running Raybestos-Manhattan belt in two sections in series. The belt is 57 in. wide and each section is 126 ft. centers between head and tail pulleys. The return side of this belt is provided with Ehram self-aligning

rolls to keep the belt running true. The carrier rolls on these belts are closely spaced and have Type SC Dodge roller bearings. The head and tail assembly pulleys of the belt system use Shafer roller bearings. Located at suitable points along these belts are "edging bars" and other devices to give the green board a final processing to produce the best looking and servicable board possible.

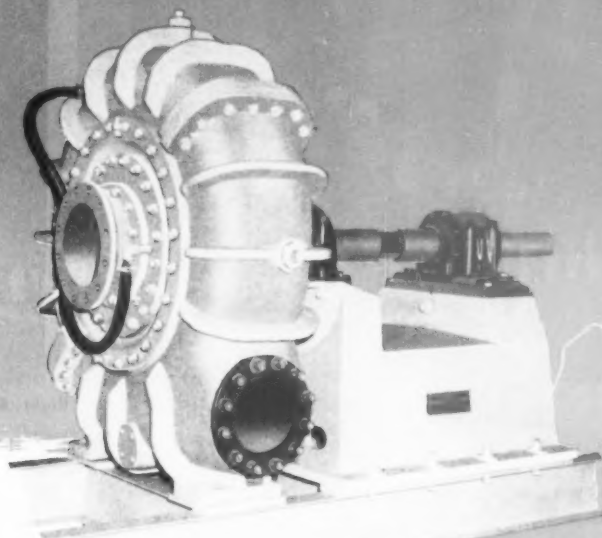
Following the 57-in. wide belt are a series of live rolls. These total 95 ft. in length. The flat live rolls, of bronze, carry the boards under an Ehram punch that is used for the lath products. Following the punch is an Ehram cut-off knife that cuts the board into pre-determined lengths. The knife operates with the board moving under it in a continuous moving band. Rejects from the Ehram punch are carried by a belt conveyor and a bucket elevator to a truck bin for final disposal.

At the end of the live rolls the board goes to a transfer table that is equipped with an "Inverter." This is



Left: Control panel for weighing feeders. **Right: One of five control panels** in the wallboard plant for the dryer and board machine

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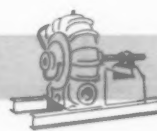


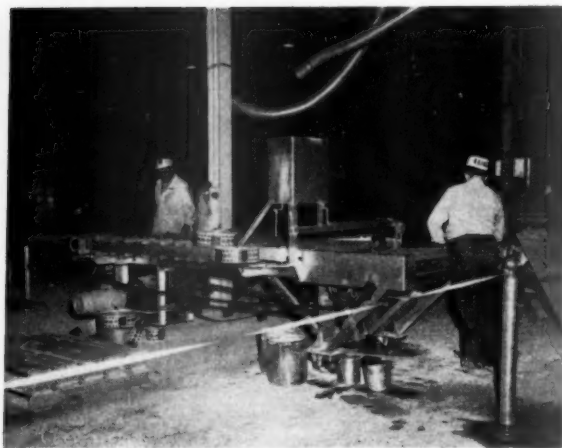
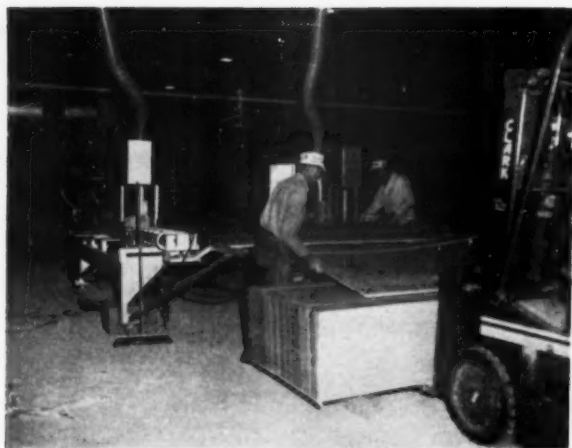
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Left: Machine for bundling wallboard. Right: Bundling machine for gypsum lath

used to turn the board completely over and is intended to put the finish side of the board, top uppermost, into the dryer.

Eight-Deck Dryer

The Coe dryer has eight decks and the wet boards are automatically fed to the desired deck by a moving tippie. The dryer is 295 ft. long and, of this length, 230 ft. is enclosed. It has a capacity of 250 tons of water per day. It takes about 80 min. for a board to pass through the unit travelling over live rolls. There are about 4000 roller bearings in the assembly of rolls in the dryer. The source of heat is steam coils augmented by suitable fans. Pyrex windows for observation of the drying board are provided at strategic points. The Coe dryer is synchronized to operate smoothly through a Selsyn electric eye control. Steam for the dryer is obtained from a Union Iron Works steam generator located in a separate boiler room.

At the unloading end of the dryer

is a second tippie that automatically spots itself at any of the eight decks of the dryer and receives the out-coming dry board. Wallboard next passes through a trimming machine where the end edges are trimmed to exactness by a series of circular saws. Gypsum lath go to a bundling machine where several pieces of board are fastened into a neat bundle with a red-colored adhesive paper bearing the Kaiser insignia as the tying material. The various products from the machine are stacked and carried to the large inside storage area by a fleet of five Clark lift trucks.

The building in which the Ehrsam board machine and the Coe dryer is located is 155 ft. wide and 600 ft. long. The two machines occupy about one-third the floor space in this room with most of the remaining space available for storage of the finished products. A covered railroad track serving the plaster mill is here available for car loading. A separate railroad spur serves the plaster mill.

Laboratory Controls

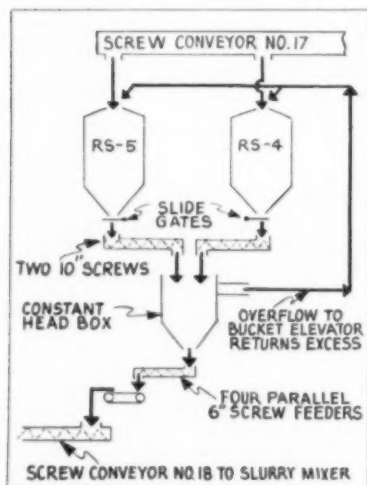
Plant offices for the wallboard superintendent and shift foreman are in an elevated structure near the head end of the wallboard machine. Ample window space permits the department heads to see what is going on in the plant.

Alongside these offices is the chemical and quality control laboratory. Besides the usual complement of screening test devices, chemical apparatus, etc., there is available a Honeywell-Brown Electronik potentiometer to measure and record the setting time of any plasters. The instant plaster sets, a considerable amount of heat is generated and this heat-curve rise is recorded and accurately fixes the setting time. It has 16 separate wire leads with each lead usually buried in the plaster that is held in a conven-

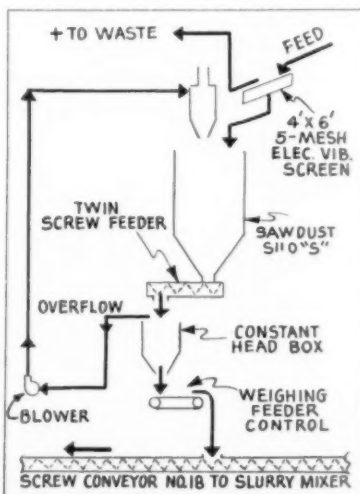
tional paper "Dixie" cup. The unit also has an indicating dial. It is said to be the first time this system has been used on products of this nature.

The laboratory also includes a device to measure the flexure of wallboard products and their breaking strengths. In this machine a piece of wallboard 12 in. square is mounted on two parallel edges. Midway and above is a parallel breaker bar. As the load on the breaker bar increases — due to shot falling slowly into a can that is a part of the assembly, the flexure is observed, and at final rupture of the specimen, the strength is noted. Specifications require that $\frac{3}{8}$ -in. wallboard hold a load of 60 lb. per sq. ft. when tested crossways of the grain of the paper, and 27 lb. per sq. ft. when tested with the grain of the paper. The grain of the paper is usually parallel to the long axis of the board. Specimens tested ran well over 100 lb.

The heart of the wallboard plant centers around the electronic control panels. There are five Clark panels



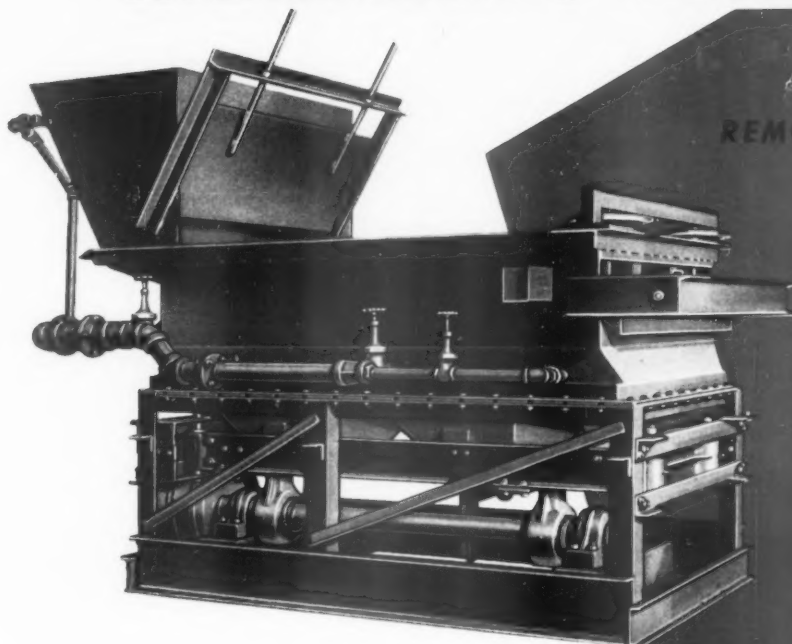
Details of stucco feeder flow



Flowsheet of sawdust handling system

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Left: Howard Weightman, chief chemist, demonstrates flexural strength test machine for wallboard. **Right: Paul Tillisch**, chemist, demonstrates electronic device that determines setting time

with a multiplicity of red and green warning lights, and the Jeffrey-Traylor Waytrol control panel. This panel consists of three Leeds and Northrup Speedomax units, that indicate the pounds per minute for the stucco, sawdust and flour. A totalizer is provided for each of these ingredients. A tachometer or r.p.m. indicator on the master screw conveyor was supplied by the Electric Tachometer Corp. It is a Type DB-16 unit. One of the control devices on the panel sets the ratio of raw materials to each other

and these ratios are synchronized into the speed of the main belt. A warning buzzer on the panel rings an alarm if any weight difficulties develop; a system of red and green lights gives a visual warning. The panel, mounted on the main floor, is several hundred feet away from, and a floor below, the point where ingredients pass into the master conveyor. Alongside the Waytrol panel is an Omega Machine Co. indicator that shows the gallons of water per hour going to the slurry mixer.

Sawdust can be delivered to the plant either by truck or by rail where a fan takes the material from the car (or truck hopper) and delivers it to a storage bin, or to the wallboard section. Under the storage bins are screw conveyors that reclaim the sawdust and deliver it to the fan.

The design of this plant and its erection was so thorough in detail that it went into high speed commercial production on practically the first day it operated. Usually in starting a wall-

(Continued on page 119)

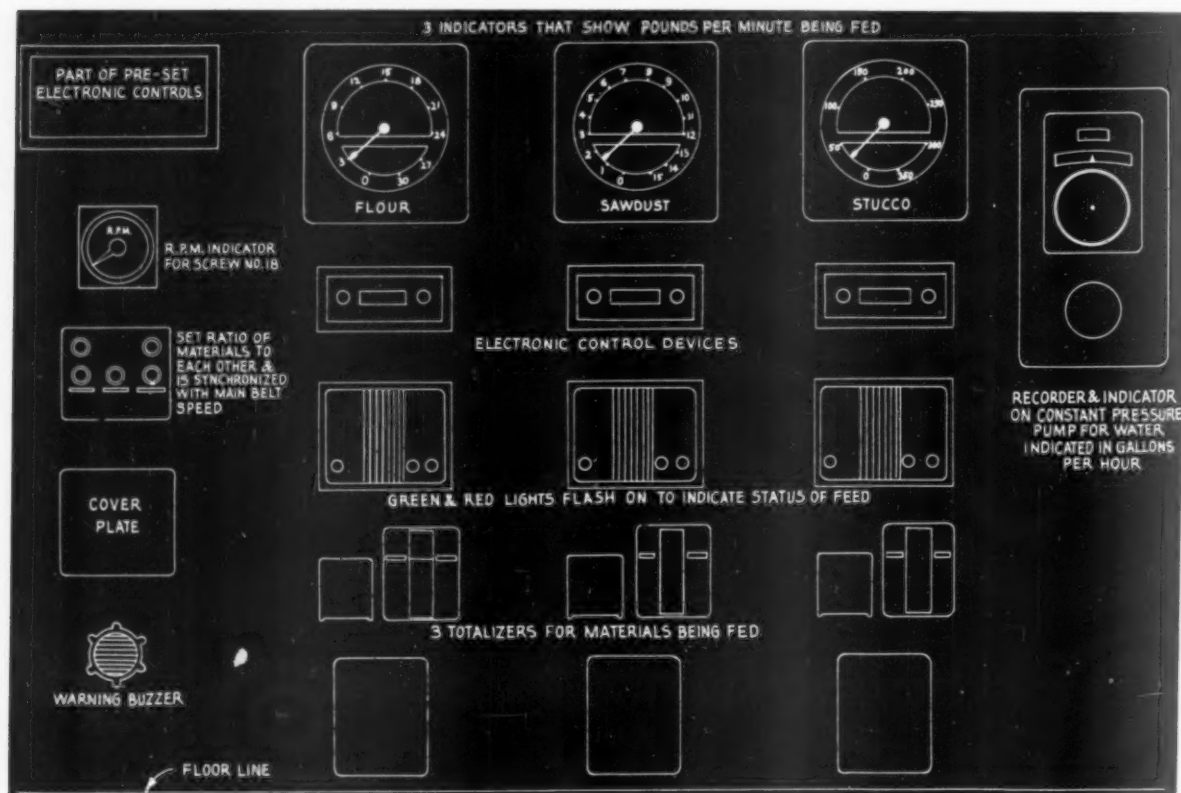
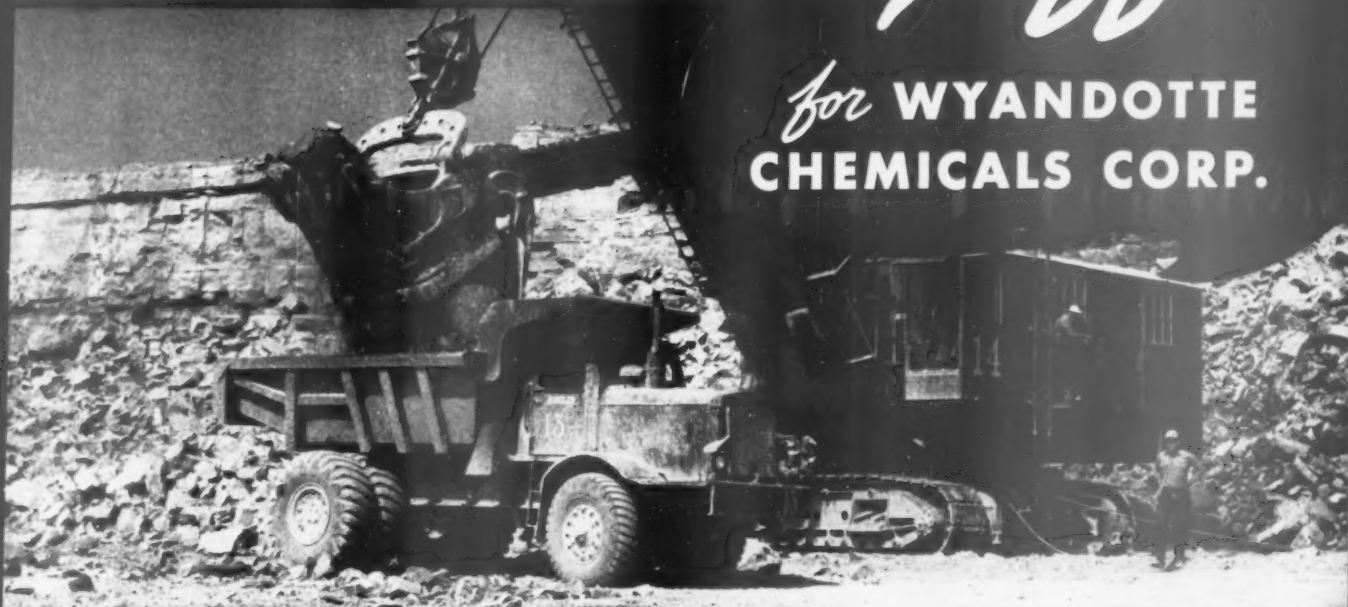


Diagram showing instruments and signals on weighing control panel

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Seven years ago Rear-Dump Euclids of 22-ton capacity replaced an electric haulage system for moving rock from the quarry face to the plant. Loaded with stone by shovels of 5 and 6 cu. yd. capacity, and hauling overburden during the winter months, these fourteen "Eucs" have worked an average of 22,000 hours each. On a two mile round trip haul, each "Euc" delivers approximately 75 tons per hour for a total of more than 3 million ton-miles per unit.

Wyandotte standardized on Rear-Dump Euclids because of their job proved dependability on hundreds of mine and quarry operations. Performance records prove this decision has paid off because "Euc" speed, capacity and efficiency have increased production and lowered hauling costs at Alpena.

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. . . because it's designed and engineered to last longer for each specific use. If you have a hose problem, Manhattan has the solution . . . over sixty years research and engineering experience assure you "More Use per Dollar" from every length you buy. You'll find the same is true of R/M conveyor belts, V-belts, flat transmission belts and other rubber products for your industry. Consult an R/M representative.

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A birds-eye view of deposit and plant. Above, to the right, is the tail tower of power scraper installation; dragline is shown in the center, below; field conveyors in the foreground; and finished storage, to the left

Largest Power Scraper Installation In the Sand and Gravel Industry

By WALTER B. LENHART

• Pioneer Sand and Gravel Co., plant at Steilacoom, Wash., has field conveyor system delivering 480 cu. yd. per hr. Power scraper bucket capacity is 12 cu. yd.

WITH THREE READY-MIXED CONCRETE PLANTS and distribution yards in Seattle, Wash., and a fleet of barges and tow boats to deliver sand and gravel to practically all the important towns and cities on Puget Sound, the Pioneer Sand and Gravel Co., is strategically located to serve

this rapidly growing area. In addition to Seattle, the company supplies construction materials to such important centers as Olympia, Bremerton, Tacoma, Everett and Bellingham.

Source of material is at Steilacoom a few miles south of Tacoma. Operations at this plant were previously

described in *ROCK PRODUCTS*, May, 1947, p. 74. The deposit is one of the most interesting in the United States. Located adjacent to the Sound and on the Northern Pacific Railroad, the pit covers a large area with a working bank that is 240 ft. high with practically no overburden and having no



Left: Looking towards head tower from field hopper with 12-cu. yd. scraper bucket in dumping position. Center: Scraper bucket scooping up a load. Right: Tail tower operates on four 4-wheel trucks with heavy concrete counterweight



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Engineering News Record Photo

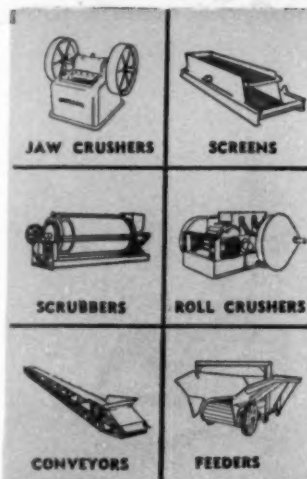
"Complete package" stationary crushing, screening, washing and loading plant designed and built by Universal for Niagara-Mohawk Power Corporation, Potsdam, New York.

Let Universal solve your aggregate problems with a Top Capacity "Engineered to the Job" plant for maximum profits. Take advantage of Universal's 50 years experience in the designing and building of all types of crushing, screening, washing and loading installations.

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Overall view of plant. Surge storage pile may be seen, to the left; washing plant is in the center with ground storage of finished material, to the right. A reclaiming belt conveyor loads finished material into barges

clay or deleterious material of any kind. In the deposit appear to be islands where the material will be high in gravel, practically all of which is of commercial size. In other zones, the deposit has a higher percentage in sand. When these latter zones are being mined, some sand is wasted and provisions have been made to use one of two 12-in. Morris sand pumps, the material being pumped out a half mile to the disposal area through a 12-in. steel pipeline. This waste line has a 6-in. water line that can be used to flush sea water through in the event of any line stoppages.

Excavation Methods

To economically excavate sand and gravel in this type of a deposit, the Pioneer Sand & Gravel Co., during the current year, installed the largest slackline scraper installation with Crescent bucket that is in use in any sand and gravel operation in the world. It is a 12-cu. yd. Sauerman unit.

One 500-hp. General Electric motor, through a long shaft, drives two Sauerman drum hoists; one drum on the pull-in line and one for the return line. A third Sauerman drum hoist is powered by a 100-hp. G.E. motor for applying tension on the sky line on which the large bucket rides. When the Crescent bucket is emptied over the field hopper, the operator applies tension on the sky-line. This raises the bucket from a few feet up to about 50 ft. above the ground line so the bucket can ride back to the rim of the pit without dragging in the sand.

When the bucket gets to the far end of the digging area, the operator lets the sky line down and with the 500-hp. motor operating the drum, pulls in a load of gravel in the conventional manner. At Steilacoom the haul is from 300 to 350 ft. The track cable is $1\frac{1}{2}$ in. in diameter. The pull-in line is also $1\frac{1}{2}$ in. and the return line is $\frac{3}{4}$ in. The pull-in is at the rate of 300 f.p.m. and the return at 835 f.p.m. The pull-in line, which takes the most wear, lasts for about 100,000 tons of operation. By the use of the right type of wire rope for the job and greater skill by the operator with more experience in handling the unit, it is expected that 250,000 tons will be produced before wire rope has to be replaced.

The head tower is about 100 ft. high, and of steel construction. The lone operator is in an enclosed cab about 40 ft. from the ground; high enough above the pit to see all the operation. The head tower, which weighs about 150 tons, is mounted on two parallel standard gauge railroad tracks, using 150-lb. steel rails with the wood ties placed about 3 in. apart. The tower rides on four sets of railroad trucks, each having four wheels, giving portability to the unit. All digging is above the water table and the floor of the pit is kept practically level. The tail tower is of steel with a counter-weight concrete block of large dimensions to give the tower stability. This tower is mounted back from the rim far enough to be safe should the 240-ft. high bank cave, and the tower is high enough for the sky line to clear

the rim when it is under tension. Air brakes control the Sauerman hoist drums with air from a Type 30 Ingersoll-Rand air compressor powered by a 3-hp. Diehl motor.

Electric power, delivered at 13000 volts to a portable bank of transformers, is stepped down to 2300 volts for use on the slackline power scraper. The three G. E. transformers are mounted on heavy wooden skids (sled runners) for portability.

The 500-hp. motor is directly connected to what has been previously referred to as a long shaft. It is actually a long extension of the main shaft of the 500-hp. motor. From this shaft a herringbone gear reduction unit drives a short jack-shaft that delivers power to the large drum through a gear and pinion. At the other end of the long shaft is the return line hoist drum which is driven from the long shaft through gears.

The 12-cu. yd. Sauerman Crescent bucket unloads to a portable field hopper of generous dimensions. It is a company-made assembly, and consists of the holding hopper under which is a belt feeder that delivers the material to a long field belt conveyor, running roughly parallel to the rim of the pit. Near one end of this long belt is a transfer station from which the material is delivered to a second long belt conveyor that operates at right angles to the first belt. From this belt system, the material is delivered to a 5- x 14-ft. Tyrock single deck scalping screen, operated dry, and mounted in a high structure. A separation is made with the minus $1\frac{1}{2}$ in. going to



Portable field hopper moves on wooden wheels over wooden track. Hopper feeds belt conveyor system to plant

its surge pile and the plus to its surge pile. The surge pile has a draw-down capacity of 6000 tons. The field system delivers 480 cu. yd. per hour or 720 tons and it was observed that the cableway excavator had to operate only about 65 to 70 percent of the time to keep the field belts loaded.

Screening, Crushing and Washing

The tail tower is mounted on two parallel tracks similar to the head tower. All conveyor belts in the field are 30 in. wide with the longest being about 1200 ft., center to center. At the time of inspection about 20 percent of the sand was being wasted.

The general flow of material through

the plant from the surge pile provides for sending the minus 1½-in. gravel to the washing plant at the rate of 280 to 300 cu. ft. per hour. The plus 1½-in. gravel is sent to the crushing plant for the production of railroad ballast and commercial crushed stone. Intermediate sizes can be crushed or sent to the wash plant. Finished material is stored in ground storage piles that are separated from each other by partitions. A reclaiming belt conveyor moves material to the barges or railroad cars. The loading belts are 30 in. wide and all others not mentioned are 24 in. The surge pile belt conveyor to the wash plant is 485 ft. centers.

The crushing plant involves the use

of one 2-ft. 4-in. TY Traylor, a 4-ft. Symons cone standard, and a 3-ft. Traylor multi-stage crusher. This multi-stage unit breaks the gravel in the upper bowl, and the lower section finishes the operation. It has been in use about six years. Normally the crushed sizes are ¾ in., ¾ in., 1 in., and 1½ in. This material is kept separate, and no crushed gravel is delivered for concrete aggregate.

Washing is done in two 42-in. by 24-ft. Link-Belt trommel screens which take out the sand. Sand is recovered by simple sand boxes. Gravel is re-screened on a series of 4- x 12-ft. Tyler two-deck screens. Six sizes of gravel are stocked over the reclaiming conveyor belt system. Blending can be done on the loading belt to meet any specifications. The loading belt is 700 ft. centers.

Barge Transportation

One tug and 10 barges, operated by the company, haul 350 to 650 cu. yd., but a number of tugs and barges on the Sound are available for rent and a considerable volume of gravel is delivered on these carriers. Trucking from the plant is nil. Tug and barges take 24 hr. to make the round trip from Steilacoom to Seattle. In the pit a 125-ft. Marion electric shovel with a 5-cu. yd. bucket is kept for stand-by purposes.

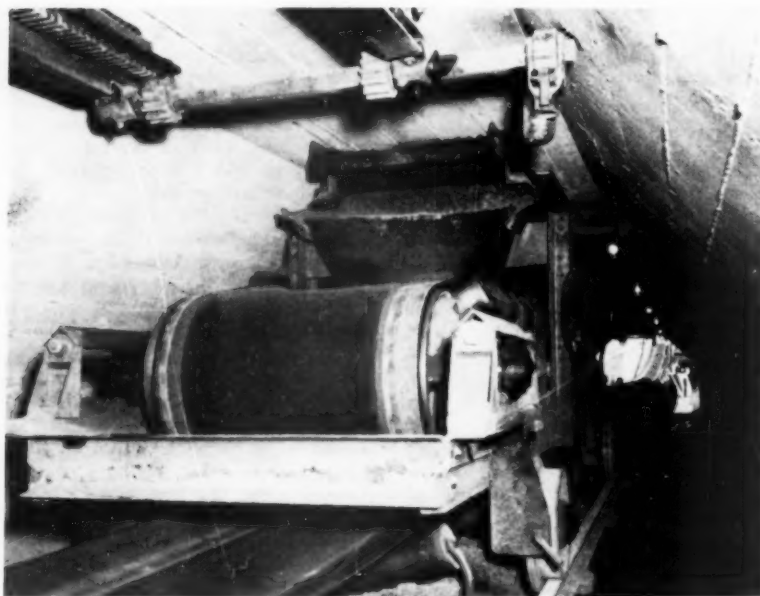
The main offices of the Pioneer Sand & Gravel Co. are at 901 Fairview Ave., Seattle. Officers of the company are Gordon N. Scott, president; Kenneth A. Stotler, vice-president and secretary-treasurer; C. L. Golding, vice-president; and V. S. Tjossem, vice-president. George V. Christensen is superintendent, and Harry Lithgow is plant foreman.

Sand Plant

FRANK MEYER, BAYPORT, MINN., recently completed expansion and modernization of his sand plant at Ivanhoe on the Cedar River just south of Mt. Vernon, Iowa. The new facilities and equipment include large bins, an Iowa feeder, Universal washer, Simplicity screen, a Speedpiler for stockpiling sand, and three International trucks. The company supplies sand to customers within a 30-mile radius of Mt. Vernon.

Annual Business Diary

DENVER EQUIPMENT CO. has compiled a 1955 Denver Annual Diary, for keeping permanent records of daily expenses, investments, insurance, taxes, vacation, birthdays, addresses and phone numbers. It also serves as a record of facts and figures for income tax forms. A copy of the diary is available by writing to the company at P. O. Box 5268, Denver 17, Colo.



Movable feeders which operate under surge pile

Chesapeake Bay Bridge Gets Concrete Pavement Made With New **LIGHTWEIGHT SOLITE**



Photographed on the job, Southern Lightweight Aggregate Corp., Brema Bluff, Va.

and 4 **SECO SCREENS** Help Make This Popular Product

This month your Seco on-the-job reporter salutes The Southern Lightweight Aggregate Corp., of Brema Bluff, Virginia, makers of Solite. This wonderful new manufactured aggregate was chosen for the surfacing of the new Chesapeake Bay Bridge because it combines great strength with a great saving in weight. For this reason, also, Solite was used to resurface the roof of the Capitol in Washington, D.C.

We at Seco are proud that the makers of Solite have chosen four Seco vibrating screens to play an important part in the production of this excellent product.

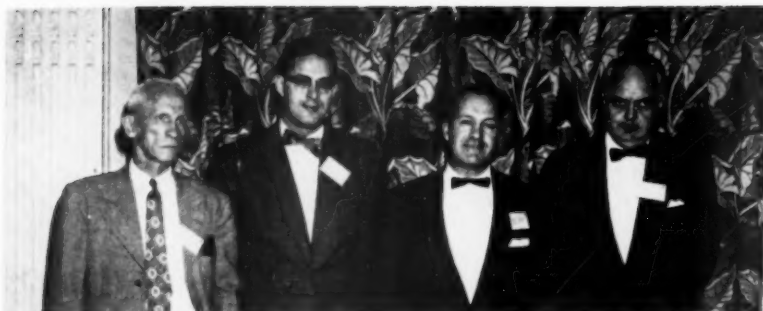
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Some of the officers of the Cement and Quarry Section, National Safety Council. Left to right: Gil G. Grieve, staff representative, N.S.C.; Kent Jander, chemical engineer, National Lime Association; Howard Riefenstahl, Alpha Portland Cement Co., vice-chairman of the section; and T. W. Jones, New Haven Trap Rock Co., New Haven, Conn., general chairman of the section

• Cement and Quarry Section, National Safety Council, in papers and addresses, covers problem of noise reduction and contributions to safer operations through machinery improvements

By HUBERT C. PERSONS

New Problems Command Attention of Safety Engineers

MEMBERS OF THE CEMENT AND QUARRY SECTION of the National Safety Council held two sessions as part of the 42nd National Safety Congress in Chicago the week of Oct. 18. The program included papers on various aspects of industrial noise, blasting practice, hazard control through engineering and a review of proven aids to industrial safety. "What Are the Facts About Industrial Noise," was also the theme of one general session of the Safety Congress.

Various speakers, specialists for the most part in legal, medical and engineering phases of industrial noise, revealed that there is a lack of dependable data on the subject and little scientific proof that industrial noise is a serious threat to the welfare of labor.

Much Concern About Noise

But the cause of much concern is the action of courts in New York and Wisconsin allowing Workmen's Compensation for alleged occupational loss of hearing to employees although they have not lost any wages or time from work. This was brought out by Noel S. Symons, Buffalo attorney of the firm of Brown, Kelly, Turner and Symons, in a talk on "Legal Aspects of Industrial Noise and Occupational Deafness." He spoke before a general meeting of the Safety Congress in the grand ballroom of the Conrad Hilton Hotel on Wednesday morning, Oct. 20, and before the Cement and Quarry Section Wednesday afternoon, in the LaSalle Hotel. Mr. Symons is legal consultant on industrial noise to the Associated Industries of New York State.

These decisions in the two states have given rise to many serious questions. Mr. Symons said, questions such as:

1. "Do these claims represent a fair demand upon the resources of the compensation system?"
2. "Is it fair to ask the employer to pay for a condition accruing over a long period of years during which, since it was not regarded as compensable, no provision has been made to liquidate the loss?"
3. "Should the public which pays all compensation costs in the price of the manufactured product or service rendered, and countless of whose members have become 'hard of hearing' because of age, be asked to assume this burden?"
4. "Do not such claims violate the wage-loss concept which is the basis of our compensation laws?"

5. "If the principle of paying for non-economic physiological and social losses becomes established where will it lead us? Will the public be called upon to pay for the deterioration and disfunction of other bodily organs and senses, such as vision, and for emotional and psychiatric disabilities, claimed to be due to work but which in no way interfere with the employee's earning capacity?"
6. "Will not the creation of this liability in a particular state seriously impair the ability of its industries to compete with similar industries in other states where this liability does not exist?"
7. "In general is not the increasing pressure for awards for non-economic losses apt to create a fabulous potential liability beyond the capacity of society to pay

(Continued on page 96)



Left to right: Russell E. Hailstone, plant engineer, Louisville Cement Corp.; L. D. Cowling, safety director, Louisville Cement Corp.; Paul M. Hedley, manager, industrial relations, North American Cement Corp.; Carl H. Rauch, safety director, Dewey Portland Cement Co.; and Howard Riefenstahl, safety director, Alpha Portland Cement Co.

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One of the largest delegations present was this 16-man group from various plants of Universal Atlas Cement Co.

and therefore detrimental to the public welfare?"

Mr. Symons pointed out that this potential cannot be accurately estimated "because of lack of acceptable criteria for determining what noise levels are actually harmful and because as yet there is no satisfactory method of evaluating the degree of hearing loss casually related to employment."

The speaker quoted Dr. Howard P. House, Chairman of the Subcommittee on Noise in Industry of the American Academy of Ophthalmology and Otolaryngology as having stated that one out of every ten persons in this country has some type or degree of impaired hearing. He also cited a recent industrial noise survey of the Armour Research Foundation indicating a fairly widespread distribution of industrial noise levels over 90 decibels in industries believed to be noisy.

Defines Decibel

"Engineering Aspects of Industrial Noise" were discussed at the Wednesday afternoon session of the Cement and Quarry Section by Jerome R. Cox, Jr., acoustical engineer for Liberty Mutual Insurance Co. of Boston. Mr. Cox used graphs and recordings of industrial noises to illustrate his concept of what are "three of the most misunderstood, yet most important words in the science of noise control."

He began with the decibel which he said was all-important to every phase of noise control but difficult for the layman to understand. He explained that although a decibel is a unit of sound intensity the idea that it has something to do with noticeable changes in sound intensity, is false and misleading. Two methods of recording the background noise in an audiometer room were shown on a chart. These were the decibel method and octave band analysis. The chart showed that in an octave band analysis, measurements in all but the lowest frequencies are too small to plot accurately. He said that the decibel method expands the small intensity range and contracts

the large intensity range.

In another chart Mr. Cox called attention to a so-called disadvantage of the decibel system. While the total intensity of two sounds is the sum of individual intensities, he showed that in terms of decibels the normal rules of addition do not hold. He illustrated this fact on the chart pointing out that 56 decibels plus 56 decibels is 59 decibels and not 112 decibels.

The second important word Mr. Cox said was absorption and the third was enclosure. With reference to absorption he pointed out that it is foolhardy to enclose a noisy machine with absorbing material in an effort to reduce the sound inside the enclosure. He said a combination of sound-absorbing and sound-isolating materials is the basis of most designs for control of air-borne noise.

There is much confusion, Mr. Cox said, regarding enclosure, the third in his trio of misunderstood words in the science of noise control. The confusion is mainly about the extent of enclosure required to eliminate or re-

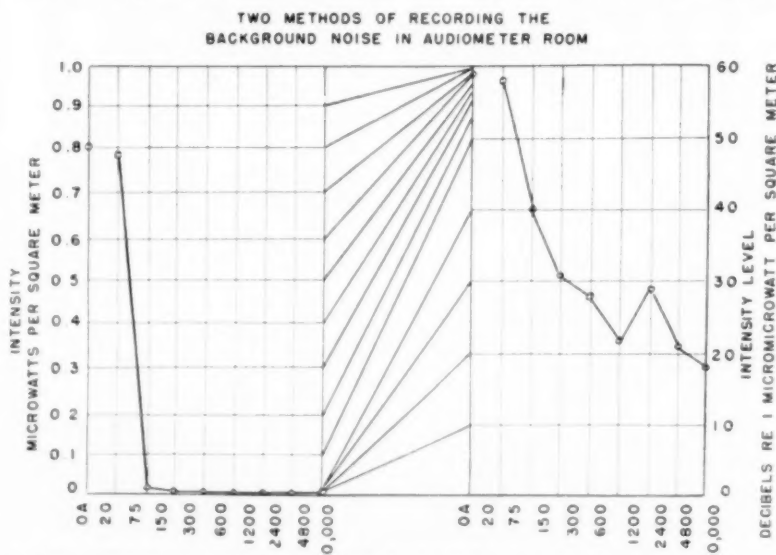
duce noise. "In noise control," he said, "enclosure means that all cracks and openings are sealed so that the resulting structure is completely air tight." As an illustration, Mr. Cox said, "Consider a concrete block wall 10 ft. in diameter. An opening in the wall one inch in diameter would, in the mid-frequency range, transmit as much sound as the entire remainder of the wall. Similarly a door placed in this wall that has a crack between it and the jamb of only a few thousandths of an inch, will, in the same frequency range, transmit as much sound as the rest of the wall."

Offers Practical Suggestions

A. B. Hoftiezer, safety supervisor, Lavarack and Haines, Inc., Buffalo, N. Y., used both screen pictures and sound recordings to illustrate his talk on "Practical Noise Control in Quarries and Mines." It was the third successive year that Mr. Hoftiezer has been invited to appear before the Cement and Quarry Section.

Mr. Hoftiezer said that he had not discovered any miraculous noise eradicator but that he had found "some simple, practical and inexpensive methods of reducing at least some of your noise." He said that most of the ideas he would describe were in use in various plants where they had been installed for purposes other than noise reduction.

"The methods that we will show you do not necessarily bring the noise levels down to the threshold of 90 decibels that has been recommended as safe," Mr. Hoftiezer explained. "But on the theory that the greater the noise level the more ear damage we can expect, the reductions indicated



Left hand plot shows an octave band analysis of noise measured in an audiometer room. Vertical axis shows intensity. Mr. Cox pointed out that measurements in all but lowest frequency band are too small to plot accurately. Noises in the higher octaves, to the right

TWELVE YEAR TD-14 PERFORMANCE RECORD prompts Acme to put 2 new TD-14As on expanded operations. Here one of new tractors dozes blasted limestone for shovel loading into haul trucks far below surface.



"We Worked Our TD-14 12 Years Before Trading" Says E. H. Warren, superintendent of Acme Limestone Company's underground mine

The Acme Limestone Company, Fort Spring, West Virginia, got the low-down on durability and performance of INTERNATIONAL crawlers by working a TD-14 for 12 years piling up blasted limestone for a shovel in its underground mine.

With Acme expanding operations, this ancient crawler that took the pounding on the roughest, toughest assignment imaginable has now been replaced by two INTERNATIONAL TD-14As and dozers. They produce approximately 150 tons hourly from

a 21-foot seam of high calcium limestone.

Superintendent E. H. Warren says, "*We have been 100% INTERNATIONAL on crawlers since 1942 with our first TD-14 working 12 years before being traded. The all-around production and service we get from INTERNATIONALS speaks for itself when we buy more as replacements.*"

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MAKES EVERY LOAD A PAYLOAD



should reduce the possibility of ear damage to your employees."

Mr. Hoftiezer described work done on a drill sharpener as the first example of noise and cure. "A 2-in. pipe had been connected to the exhaust of the head, the pipe terminating outside the building. "We found that with the pipe connected the noise level during operation was only 102 decibels," Mr. Hoftiezer said. "When we disconnected the pipe, and let the exhaust escape in the building, the noise level climbed to 112 decibels. So we checked the shank hammer and found that it was creating noise at a level of 120 decibels. We attached a hose to it to take the exhaust outside the building and the noise level dropped to 104 decibels."

Mr. Hoftiezer referred to the fact that use of diamond drills has increased in recent years. "We found that these machines," he said, "build up a noise level in their second speed, of 110 to 113 decibels. But the exhaust ports do not permit fastening a hose or pipe. When this was called to the manufacturer's attention, they immediately offered to redesign the exhaust port to permit attachment of a flexible pipe or hose."

"Your crusher feeders are exposed to rather high noise levels," the speaker said. "We found that the little wooden shanty that is sometimes built to protect the operator from bad weather, even when made of just 1-in. wooden boards, would reduce the noise level from 108 decibels to 104 decibels, and at a modern plant where the crusher feeder had a glass enclosed job, the noise outside was 96 to 104 decibels. Inside the enclosure it dropped to 86 to 94 decibels. So why not build good enclosures for all of the crusher feeder operators?"

An enclosure for the mill-man was also urged by Mr. Hoftiezer. "We found noise levels on the screen and crusher floors ranging from 100 decibels to as high as 113 decibels," he said. "A mill-man need be around his machines for only a small portion of his time if everything is going right. Why not give him an enclosure?"

Mr. Hoftiezer said that noise levels as high as 120 decibels had been found at the point of discharge from conveyor belts. In one instance he said the placing of dirt traps or rock baffles at the point where the rock struck the side of the hopper, reduced the noise level to 103 decibels. He described another noisy discharge point where the plant workmen had rigged up an old piece of rubber belting as a pad at the point where the rock struck and thus reduced the noise level from 106 to 99 decibels.

The speaker described the noise level at vibrating screens as ranging as

high as 114 decibels. "While a good share of this noise is created by the screen mechanism itself," he said, "we found a variation of 2 to 6 decibels could be established if the material was caught on the steel slide at the end of the screen to act as a cushion. On some screens the rock was made to drop as much as 12 in., on others only 2-in.; same type of screen in the same mill but 10 in. more drop to create that much more noise."

"We also discovered quite a difference in noise level between screens mounted on steel springs and those mounted on rubber. With a comparable load, we appeared to get a difference of 6 decibels."

General Session on Noise

In addition to Mr. Symons, who also addressed the Cement and Quarry Section, Dr. Aram Glorig of Los Angeles and Dr. Howard C. Hardy of Chicago were speakers at the general session on "What Are the Facts About Industrial Noise."

Dr. Glorig is director of research, American Academy of Ophthalmology and Otolaryngology. He spoke on "The Medical Aspects of Industrial Noise."

Dr. Hardy is assistant manager of the Physics Research Department, Armour Research Foundation of the Illinois Institute of Technology. He spoke on "The Physical Aspects of Industrial Noise."

Dr. Glorig said that present evidence refutes claims that noise causes nervousness, fatigue, inefficiency, sterility and even death, except in the case of extremely loud noises as produced by afterburning jet engines. He said much research is being done on industrial noise and summed up the present status of the subjects:

1. "The physician's role is one of conservation, not the legal aspects of compensation."
2. "Industry should confine itself to preplacement and follow-up testing for compensation and conservatory purposes. Any more than this is diagnostic and should be handled by an otologist."
3. "At present there are only two effects of noise which can be supported by valid evidence — its effect on speech communication and its effect on human hearing."
4. "There is still much research to be done before we can say how much noise will produce how much hearing loss in how many people."

Dr. Glorig said many questions must be answered before industry can set up properly controlled hearing conservation programs. In the meantime he suggested the following lines of procedure for industry:

"All routine preplacement physical examinations must include audiometric tests."

"All individuals working in noisy areas suspected of having produced a hearing loss should be followed with hearing checks every six months."

"All suspected areas should be studied for possible noise reduction procedures."

"Educational programs regarding ear protectors must be instituted."

"Preplacement audiograms are necessary to protect both the employer and the employee," Dr. Glorig said.

Dr. Hardy in his talk on "Physical Aspect of Industrial Noise," pointed out that the problem of noise is getting more attention today than formerly because of increased mechanization and faster machinery. Referring to measurements of sound, he said that high frequency sounds are most dangerous. An environment where one cannot hear ordinary conversation is likely to be a zone of danger, he said.

A Challenge to Safety Engineers

M. C. M. Pollard, director of safety, National Gypsum Co., Buffalo, N. Y., 1954 General Chairman, presided over both sessions of the Cement and Quarry Section. In summing up the high lights of the program Mr. Pollard complimented the speakers for the thoroughness with which the subject of noise had been covered. He declared that safety engineers have never before been confronted with such a challenge as is now offered by the noise problem. Speaking on "Practical Aspects of Noise Control in Cement and Quarry Industries, Mr. Pollard said in part:

"These introductory remarks have been made to indicate to you that perhaps the best approach is the one that applies to most everything else that we do. Be practical. In order to know where to begin, you must find out two things:

"Is yours a noisy plant or operation?"

"Is there a hearing impairment among the people who work in your plant and if so what is the cause?"

"How do you get the answers to these questions and why do you need them?"

"New York State's aggressive Workmen's Compensation Board chairman passed out questions for a panel of experts, primarily physicians specializing in ears. She asked them to spell out what level of noise was harmful. The cautious answer to this established a lower limit of 90 decibels. For all practical purposes this reply has become the standard for your effort. If

(Continued on page 102)

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VICTORTUBE "SPECIAL"	Abrasion, severe impact	Oilfield bits, rock bits	Acety. only
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutters, brick augers, pug mill knives, screw conveyors, farm tools	Acety. AC-DC Elec.
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides	Acety. AC-DC Elec.
TUBE VICTORITE	Abrasion, impact	Plow points and farm tools	Acety. AC-DC Elec.
VICTORITE 1	Corrosion, heat, abrasion	Saw teeth, carbon scrapers, wire guides, rocker arms, steel mill applications	Acety. AC-DC Elec.
VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trim- ming dies, cams, hot punches, pump shafts	Acety. AC-DC Elec.
VICTORITE 12	Heat, abrasion, impact	Saw blade inserts and other critical applications	Acety. AC-DC Elec.
VICTORITE CARBON ARC	High abrasion, thin deposit	Plowshares, lister shares, sweeps	Carb. arc Acety.
VICTORALLOY	Abrasion, severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers, roll crushers	Acety. AC-DC Elec.
VICTORALLOY #1	High abrasion, medium impact	Bucket lips, rock crushers, Muller tires, gyratories	Acety. AC-DC Elec.
VICTORALLOY "A"	Angular shock, extreme impact, build-up	Clutch parts, gears, crusher plates, gyratory mantles, build-up for hardfacing	AC-DC Elec. only
VICTORALLOY "B"	Heavy impact, moderate abrasion	Tractor rollers and sprockets, shovel pads, plates, idlers, etc.	AC-DC Elec. only
VICTORALLOY "C"	High abrasion, moderate shock and impact	Tractor grousers, pressure rolls, crusher segments, roll crusher teeth	AC-DC Elec. only

Also VICTOR Bulk Metals, VICTORITE Plow Point Bars, and VICTOR Super-Titan
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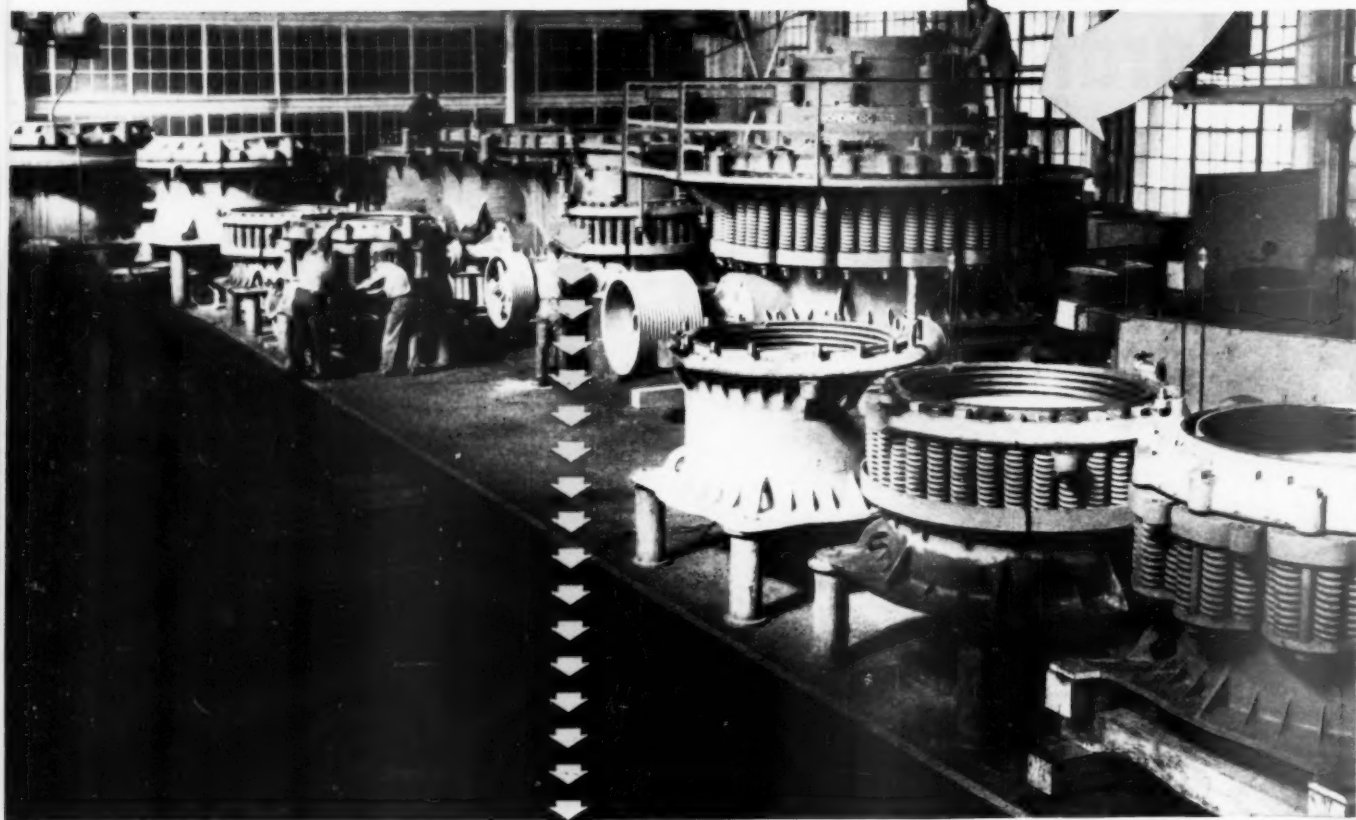
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VA #2	Abrasion, impact, Multi-pass application	Steel mill applications
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VA #4	Multiple layer build-up	Tractor rails, crane wheels, general build-up
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VA #6	Medium abrasion, high impact	Crane wheels, drums, roll necks
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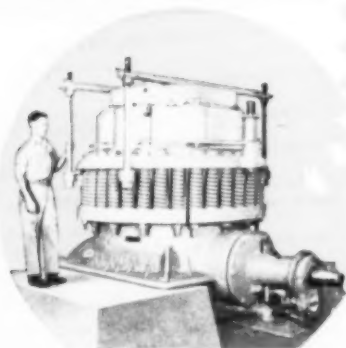
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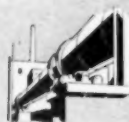
ASBESTOS.....	18	IRON.....	32
ABRASIVES.....	16	LEAD-ZINC	24
CEMENT.....	6	MOLYBDENUM.....	18
COPPER.....	41	NICKEL.....	28
FELDSPAR.....	15	NITRATE.....	11
GOLD.....	8	REFRACTORIES.....	12
GRAVEL.....	18	STONE.....	39



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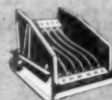
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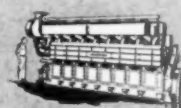
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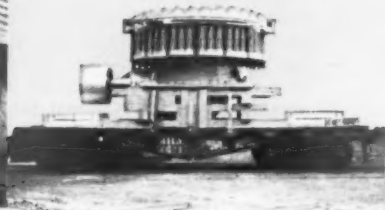
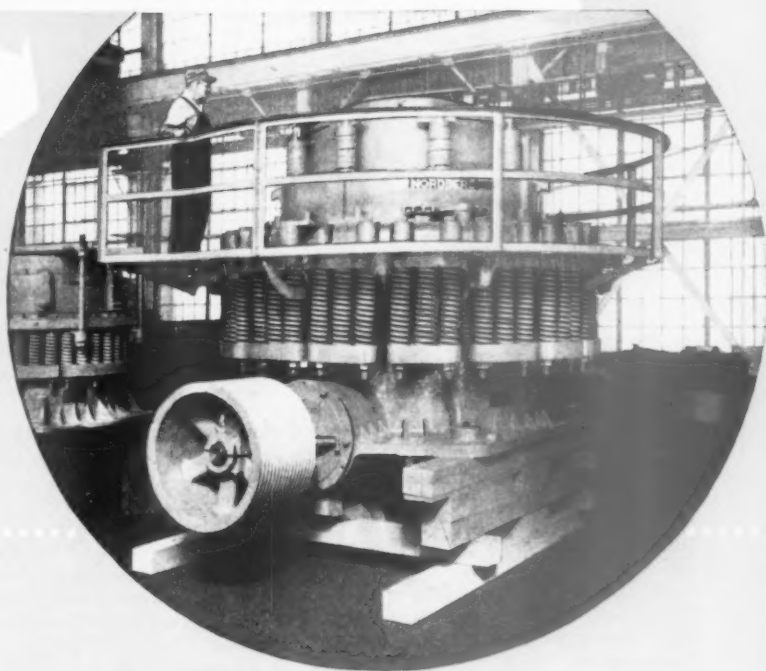
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KNOWN THROUGHOUT THE WORLD

Safety Congress Meetings

(Continued from page 98)

you have noise of 90 decibels or more in your operations, you are right in the middle of this problem.

"To determine that this level exists, all you have to do is take a walk around when you get back to work. Generally speaking, if you must raise your voice to carry on a conversation with a man about 3 ft. from you, the level of 90 decibels is being exceeded. Make notes of such locations, including the number of people involved. Confirm your findings by touring each area again in the company of the responsible supervisor. The two of you agree on each situation. When the entire operation has been thus covered, discuss results with your boss and if he is not the top man, make certain the information is given to him.

"Request a meeting of the plant management, including all of the supervisors you worked with in obtaining the sketchy data, and discuss your problem. Without any study on your part, other than this, do not pretend you know all the answers. Even though you have attended every session devoted to noise at the National Safety Congress, you would be a most unusual person to come out with enough understanding to intelligently reply to the questions that will be raised. This is a hard surface and it has only been scratched."

Mr. Pollard said certain conclusions can come from such a meeting and listed them as follows:

- (1) What operations generate the most noise?
- (2) What equipment and machinery is used in these operations?
- (3) How many people work around each operation?
- (4) For approximately what period of time each day do they work in that noise?
- (5) How long has each man worked in that particular area?
- (6) How would his supervisor rate each such individual's ability to hear?
- (7) How many of these people do you have whose hearing is thought to be impaired?
- (8) What are their ages?
- (9) Can anything be done about producing less noise at any one particular location?

Suggest that further study be made to determine just what it is that produces the noise of each operation?"

Mr. Pollard recommended that every safety engineer should purchase a sound survey meter and make a close study of the noise level existing in every part of his plant.

He also urged that an audiometer be used to give hearing examinations

to plant employees in order to learn whether a hearing problem exists, as well as to conduct preplacement examinations for people to be employed. As a final suggestion, Mr. Pollard said: "Keep constantly after the manufacturers of the equipment and machinery you use, to make it more quiet. When new plants are built or your existing plants expanded, make certain your engineering department does what it can to design it to produce less noise."

A full color motion picture entitled, "Safe Blasting Practice in Open Pit Mines," was presented by G. A. Borgeson, claims manager, M. A. Hanna Co., Hibbing, Minn. at the Thursday afternoon session of the Cement and Quarry Section. Mr. Borgeson said the picture illustrated a number of recent developments in safer blasting caps, fuse and blasting technique.

Proven Aids to Better Safety

Howard Riefenstahl, safety director, Alpha Portland Cement Co., Easton, Pa., delivered a completely practical talk on "Proven Aids to Better Safety," as the second feature of the Thursday afternoon program. His talk was illustrated with pictures showing a number of unsafe practices and how they were corrected.

"Through recent years of the growing industrial era, aggressive managements have progressed, building safety engineering into new plant layouts and rebuilding safety into old," Mr. Riefenstahl said. "They have organized and revitalized safety committees and programs for plant personnel. And they have provided personnel protective equipment to those who sometimes are unhappy and unappreciative of management's desire to protect them from occupational hazards.

"I am a believer in, shall we say 'Safety Gadgetry'. Gadgets and gimmicks sometimes will sell a safety idea to workers quicker than all the pleading, cajoling, and threats anyone can imagine. Gimmicks and gadgets seem to have more appeal value to employees — something new they can use and talk about."

As examples of gadgets and gimmicks, Mr. Riefenstahl threw on the screen pictures of an air ram to actuate tracks switches and eliminate "on the fly switching," and a latching tool for fastening hatch covers on railroad bulk cars. He also explained how use of a mirror by a car dumper showed the condition of the crusher hopper at all times and eliminated the dangerous practice of squeezing between cars to see into the hopper.

"Today many industries stress safety incentive plans," Mr. Riefenstahl said. "To do a good job of selling safety, those charged with safety responsi-

bility must understand people and human relations. Cooperation and effectiveness of a safety program depends upon the enthusiasm of both workers and supervisors toward safety. Laggard enthusiasm must be bolstered from time to time with new ideas, new contests and schemes to revitalize and stimulate safety thinking."

An incentive plan being used in Alpha plants to encourage wearing of safety shoes, hard hats and safety glasses was described in detail by the speaker. This includes weekly cash prizes of from \$5 to \$25 awarded to employees who are properly equipped from the standpoint of safety when approached by a "Mystery Man."

Controlling Hazards

"Hazard Control Through Engineering in the Portland Cement Industry," was the closing feature on the Thursday program of the Cement and Quarry Section. The subject was interestingly presented by Claude W. Farmer, safety engineer of the Accident Prevention Bureau of the Portland Cement Association.

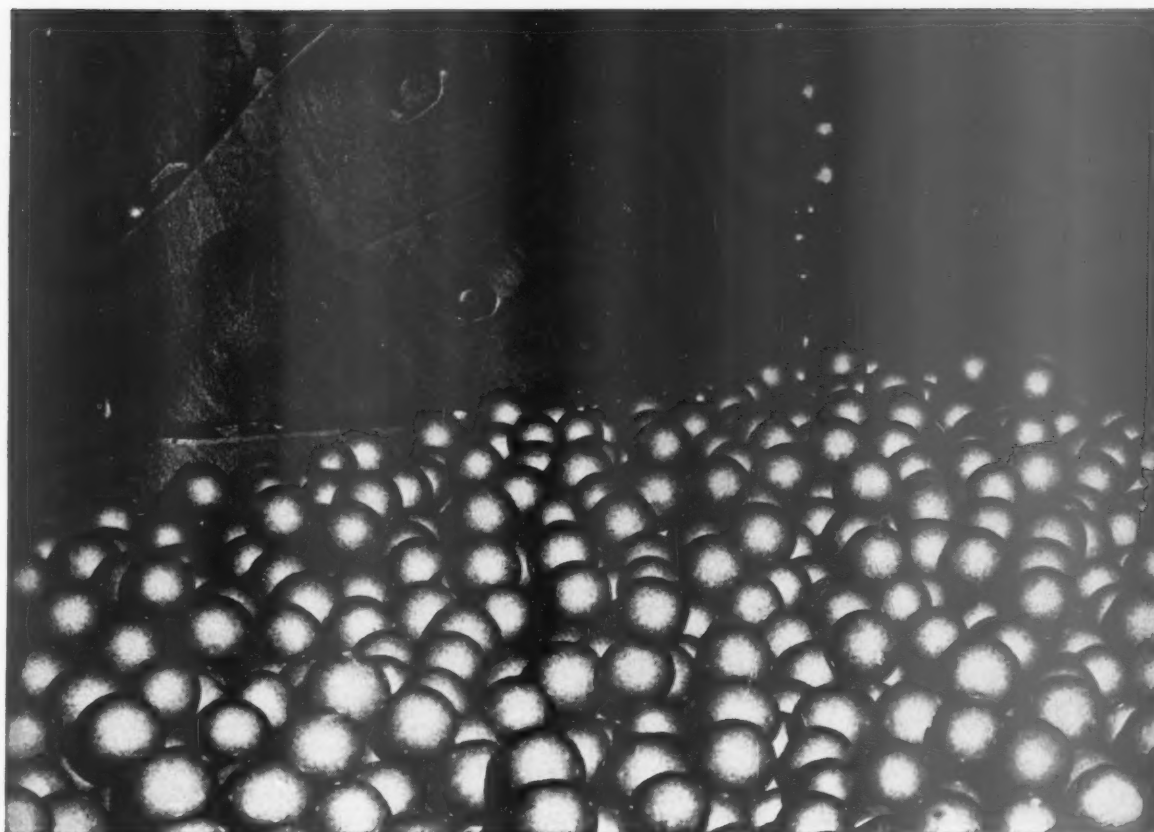
"Progress in 1954 shows the following major gains," Mr. Farmer said:

1. A decline of almost one-half in fatal injuries resulting in a current injury severity rate that for the first time in history is less than the average for 40 industries cooperating in the National Safety Council studies.
2. Quarries and mines have maintained better control of frequency and severity. There has been but one fatal injury in these operations as compared to three in the same period last year.
3. There are now more accident-free operating units than in any comparable previous period.


Mr. Farmer reviewed the cement industry's early efforts to prevent accidents through putting guards over gears, chains, sprockets and shafts, and barriers and hand rails around platforms, stairways and operating machinery. However, education and training and rigid safety rules combined with physical safeguards still did not produce the desired reduction in accidents. Frequency was reduced but severity remained high. It was found, Mr. Farmer said, that about 25 percent of the accidents resulted from mechanical or environmental causes, and 75 percent from unsafe behavior.

"Overall safety engineering in the cement industry started at this point," Mr. Farmer declared. "Experience indicated that sufficient accident progress could not be made by means of isolated attacks upon the individual factors. A thorough analysis was made

(Continued on page 132)



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Left to right: W. S. Shaw, treasurer of N.S.A., Washington, D. C.; R. O. Dierker, incoming president of association, Duquesne Slag Co.; Pittsburgh, Penn.; C. A. Barinowski, president of N.S.A., Birmingham Slag Co., Birmingham, Ala.; and E. W. Bauman, managing director of association, Washington, D. C.

• National Slag Association annual meeting in Washington, D. C., reveals substantial increase in sales and new outlets for products. Research program pointed to the development of wider use of slag for highways and structures

Slag Industry Developing New Markets

THE THIRTY-SEVENTH ANNUAL MEETING of the National Slag Association, held October 26 and 27, at the Mayflower Hotel, Washington, D. C., had an excellent attendance and a well-rounded program. Meetings consisted of two open sessions and the annual meeting of the board of directors.

President C. A. Barinowski, Birmingham Slag Co., presided for the opening session which heard the annual reports of the director of research and the managing director and geographic reports on current trends in slag utilization. Russell E. Train, clerk of the committee, House Ways and Means, discussed "The Internal Revenue Code of 1954" and answered many questions from the floor particularly on the subject of plant depreciation.

An afternoon session was set aside entirely for a roundtable discussion of slag problems with R. O. Dierker, Duquesne Slag Products Co., serving as moderator.

Social events included a pre-convention get-together and the annual reception and banquet at which a number of representatives from government agencies and from allied trade associations and industries were present as invited guests.

Officers

R. O. Dierker, president of Duquesne Slag Products Co., Pittsburgh, Penn., was elected president of the association and R. K. Plumb, manager of Slag Sales, United States Steel Corp., Pittsburgh, Penn., was elected vice-president. E. W. Bauman and W. S. Shaw, N.S.A., were re-elected managing director and treasurer, respectively.

Elected members at large of the executive committee were: C. W. Ireland,

president, Birmingham Slag Co., Birmingham, Ala.; L. E. McDermut, president, Illinois Slag and Ballast Co., Chicago, Ill.; A. W. Wood, manager, Cleveland Slag Co., Cleveland, Ohio; and G. W. Lanier, Manager, Houston Slag Materials Co., Houston, Texas.

The outlook for the slag industry continues very favorable, apparently only limited by the availability of slag from the blast furnaces, and the association membership is now at an all-time peak with 27 active members. Indiana Slag Co., Inc., H. Bairstow Co. and National Slag Limited joined the association during the year and there was one resignation.

Managing Director's Report

Managing Director E. W. Bauman's report covered all current accomplishments and activities of the association. He first discussed the growth of the industry and suggested a course of action to increase sales volume. The

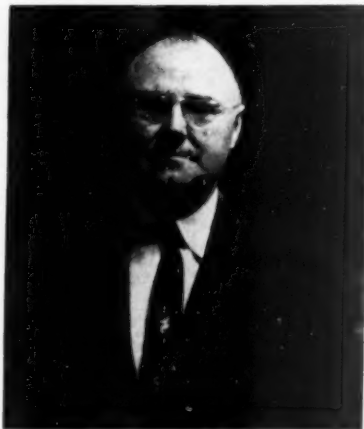
industry had a total sales volume of 16,706,792 tons in 1946, at the time Mr. Bauman joined N.S.A., and volume has steadily increased to a peak of 30,511,600 tons in 1953. Demand for slag as an aggregate has now surpassed the tonnage available from the blast furnaces in some areas and, as a result, the 1954 tonnage will likely fall short of 30 million tons.

It was suggested by Mr. Bauman that the industry should probably turn its attention to open hearth slag disposal in its efforts to progress.

This field was suggested as presenting both an opportunity to increase sales and a problem. Some of the industry are already attempting the disposal of open hearth slag, with caution, so as not to jeopardize the high standing of blast furnace slag. A recent report on open hearth slag used in base courses for pavement had indicated that its performance in service might produce unfavorable results.

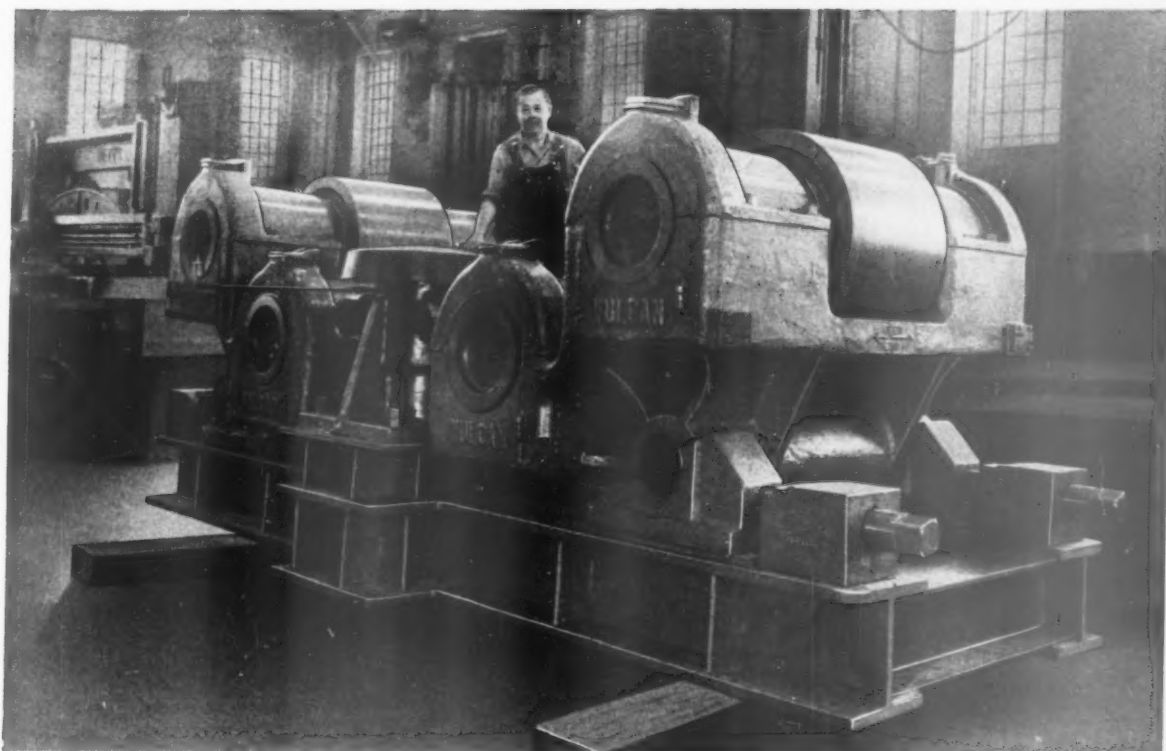
Mr. Bauman's main concern is that outsiders might encourage the use of open hearth slag for all purposes where blast furnace slag is now accepted in high confidence as an all-purpose construction aggregate. It was suggested that the industry possibly seek economical means of treating open hearth slag in order to improve its properties. Experimentation is now underway in Pennsylvania for reclaiming manganese from open hearth slag which, if successful, would yield residual slag practically the same as the blast furnace type. At current rates of steel production, the yield is about 12 million tons of open hearth slag annually.

Mr. Bauman next talked about new fields for the use of slag and made three suggestions as examples of programs for consideration. One might



R. O. Dierker, Duquesne Slag Co., Pittsburgh, Penn., was elected president of the National Slag Association.

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Left to right: Frank Thomas, George W. Weiss and Bill Spooner, all from Bethlehem Steel Co., Sparrows Point, Md.; C. A. Barinowski, president of N.S.A., Birmingham Slag Co., Birmingham, Ala.; Bob Dierker, incoming president of association, Duquesne Slag Co., Pittsburgh, Penn.; E. W. Bauman, managing director of the association, Washington, D. C.; Irving Warner, Jr., Warner Co., Morrisville, Penn.; H. N. Snyder, Buffalo Slag Co., Buffalo, N. Y.; and Karl Dunbar, K. L. Dunbar Co., Sharon, Penn.

be work directed toward developing uses in specialized fields such as in the chemical industry which holds promise.

A second effort might be research in the development of a higher type lightweight aggregate, since expanded slag is now a relatively small percentage of total output. It would be necessary to produce such a material with more uniform and higher strengths than the present product has, he said, in order to compete successfully with expanded shales in the lightweight plastic concrete market. His third suggestion was that molten slag might be processed into an excellent insulation material.

National Slag Association will have a booth in the exhibit of highway materials at the January 10-13, 1955, meeting of the American Road Builders Association in New Orleans, La. Plans for the booth were discussed and a booth will be designed that will be adaptable for other displays as well as by individual member companies.

Mr. Bauman summarized the many requests for information handled through his office, and committee activities in the interest of the industry. Currently, the association is negotiating with the Masonry Committee of the A.R.E.A. to have the specifications on aggregates revised by deleting the requirement for aging slag a minimum of one year prior to its proposed use in concrete. It is felt that this requirement has no merit and is one that will continue to cause unnecessary difficulties.

During the year the N.S.A. executive committee held one meeting, the

technical committee met twice and the plant operators' group held its organizational meeting. The latter group will hold its second meeting during the first week in December. At that time, the *Pit and Quarry* safety trophies and special certificates will be presented the winners of the 1953 safety contest which is sponsored by N.S.A.

Winners of the trophies to be presented are the Fairfield plant of Birmingham Slag Co. in the class A competition and the Donora plant of Cambria Slag Co. in the class B competition.

The Fairfield plant operated 116,365 man-hours without a lost-time injury during the year from April 1, 1953, through March 31, 1954. Eight other plants in this large-sized plant group had no disabling injuries during the 1953 competition. The Donora plant had a record of 58,921 man-hours worked without lost-time injury in the competition for plants operating less than 60,000 man-hours. Thirteen other plants in this group had injury-free records but worked fewer man-hours.

Mr. Bauman concluded with a report on membership and an invitation for all members to visit the association's new, modern quarters at 613 Perpetual Building, Washington, D. C.

Research Report

The report of director of research Fred Hubbard was read by president Barinowski in the absence of Mr. Hubbard who was in Europe representing the association and presenting a paper at the International Conference on Slag in Brussels, Belgium,

October 19-22. He is also inspecting European slag operations.

Fully revised and expanded concrete proportioning tables, for both air-entrained and non-air-entrained concrete, and including four additional tables giving the cement factor, water-cement ratio strength relationships were completed in 1954 and released for publication. Data for $\frac{3}{8}$ -in. and $\frac{1}{2}$ -in. nominal maximum size aggregate were also added. Revision of the tables was done to bring them in conformity with A.C.I. data. Mr. Hubbard believes them to be practical and that they will have widespread acceptance particularly by ready-mixed concrete producers.

A specification for portland cement concrete was released in 1954 which, according to Mr. Hubbard, should be of particular value to architects, and it is hoped that in many instances it will be adopted and made a part of contract specifications. This is a complete specification for concrete, covering materials, proportioning, placing, finishing and curing of concrete, forms and, by reference, reinforcing steel.

Much laboratory work has been done in 1954 on the use of expanded slag aggregates for structural or plastic concrete, and fundamental data on concrete proportions and compressive and transverse strengths have been developed. Work is continuing in the laboratory relative to volume change in the concrete due to temperature and moisture change, and freezing and thawing tests to determine durability of the concrete are being carried forward to 300 cycles.

Due to specification requirements and because of adverse interpretation of tests, the association has acquired testing equipment to conduct the California bearing ratio test for stability.

According to Mr. Hubbard, approximately one-fourth of the 241-mile Ohio Turnpike is being built of slag, including concrete aggregate, penetration macadam and granulated slag for a 6-in. subbase under the 10-in. concrete pavement. A pictorial record of this construction is being kept by movies and photographs. Also, the Pennsylvania Turnpike Commission has specified slag for the surface course of the bituminous concrete in its advertising for the resurfacing of 22 miles of the original pavement. Slag was chosen principally because of its skid-resisting properties.

Mr. Hubbard's report covered the need for continued research and three specific major projects approved by the technical committee as desirable. One is the investigation of the transverse strength of slag concrete as affected by the chemical and physical characteristics of slag aggregate. The

(Continued on page 123)

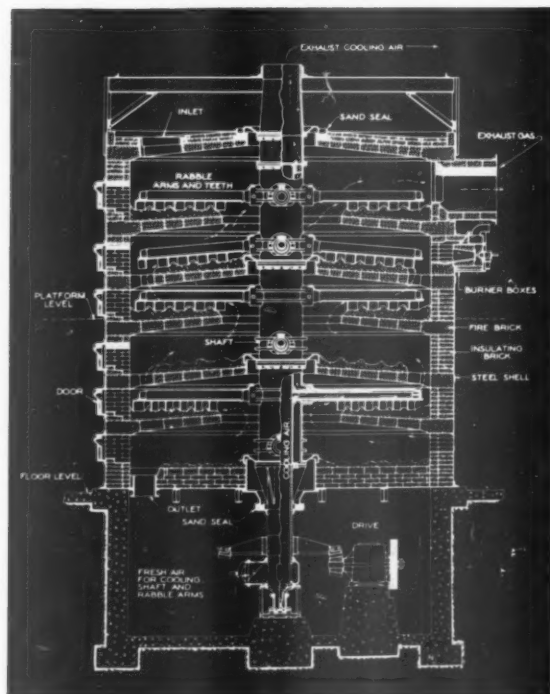
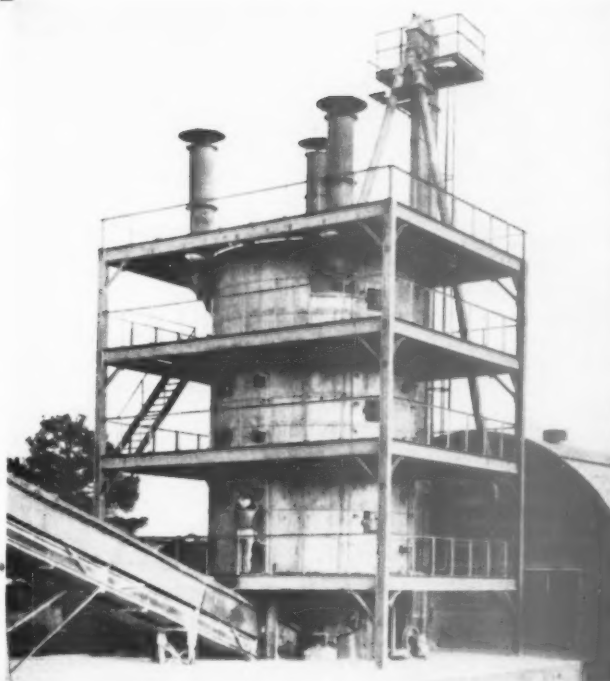
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Industrial Sand Producers Urged to Engage In More Research

• National Industrial Sand Association semi-annual meeting in New York City discusses freight rates, business conditions, labor problems, foundry sand specifications, workmen's compensation, taxation, and plant studies

MORE THAN 100 MEMBERS and wives attended the semi-annual meeting of the National Industrial Sand Association at New York City, October 20-22, 1954. There were three business sessions with president Clarence R. Wolf, vice-president Emory M. Durstine, and treasurer William J. Cannon serving as the presiding officers. Entertainment consisted of two evening "open houses" and a boat ride around New York Harbor.

The main subjects of the meetings consisted of a report by the association counsel on matters relating to industrial hygiene and workmen's compensation, discussion of traffic matters, committee reports, a discussion of percentage depletion and other features of the Internal Revenue Code of 1954 by the association's tax counsel, and discussions on the business outlook. The meetings concluded with executive secretary V. P. Ahearn's unofficial appraisal of the Washington scene.

The next annual meeting of the association will be held May 11-13, 1955, at The Homestead, Hot Springs, Va., and the 1955 semi-annual meeting will be September 21-23, at the Greenbrier, White Sulphur Springs, W. Va.

President Clarence R. Wolf opened the sessions by citing the need for research in order to meet growing competition and to develop new markets for industrial sand so that tonnage of the industry might be maintained. He recommended that plant operations be kept in best possible condition as an important contribution to good public relations.

Emory M. Durstine followed with a brief discussion of traffic matters, pointing to millions of dollars saved customers by the association's successful efforts in gaining reductions in the freight rates charged for ground sand and molding sand shipped in closed cars, and including adjustments obtained for bonded sand. Work is continuing in attempts to gain further revisions, and also to obtain bonded sand rates that will be more favorable with respect to those charged

for unbonded sand to be mixed with clay.

According to spot checks on the business picture, glass sand business apparently continues at a high level but the outlook is not so optimistic for other types of sand. Foundry sand producers, generally, had less volume of business in 1954 than in 1953. As for 1955, a large eastern foundry sand producer expects volume of sales in 1955 to equal the figures for 1954. A midwestern producer expects a slight increase in volume whereas a large producer of foundry sands in the Great Lakes area expects business to drop. Sand reclamation practices in some foundries are having an adverse effect.

Committee Reports

Chairman Earle T. Andrews of the advisory committee on health commented briefly on the plant survey conducted for the association by Theodore F. Hatch of the Industrial Hygiene Foundation and said that it is hoped that study will lead to a desire for studies to be made of specific individual plants.

Chairman Ralph S. Lebold of the advisory committee on labor called on committee members for comments. It was reported for the Milwaukee-Chicago area that there is considerable agitation for welfare programs. Little in the way of wage increases was reported for the Ohio area. An eastern producer said that labor is seeking 54-hr. pay for a 45-hr. week, but that labor generally is easier. Pension plans are also being sought in New Jersey.

In the Detroit area, labor is seeking a guaranteed annual wage which it likely will not gain but which will require a great deal of bargaining to offset. Labor supply is easier, attitudes are better and absenteeism less. An Illinois producer said that his company is keeping pensions, hospital plans and the like entirely out of labor negotiations which is beneficial in showing the worker that he is actually getting extra benefits in the form of these special programs.

The committee on fineness and grading of foundry sands, William D. Chadwick, chairman, is working with the A.F.S. in the standardization of sieves. A study is being made, using glass spheres for the calibration of sieves. The A.F.S. fineness number is under criticism as to whether it is truly descriptive of the properties of molding sand.

The committee on revision of the publication "Safety in Sandblasting," A. Warsaw, chairman, has revised that publication. It was first published in July, 1948, to assist in making available information on the correct usage of sandblasting facilities and was offered to industry in the cause of health conservation and safety. A second edition was printed later in 1948, due to the heavy demand, and the third edition now available was revised to incorporate latest available information on the subject.

Arthur B. Schlesinger, chairman of the committee on use of silica flour in autoclaved products, discussed the potential market in the future and suggested the need for research to substantiate the value of silica flour in this field.

Workmen's Compensation

Association counsel Theodore C. Waters presented an excellent paper covering matters of current interest in the field of industrial hygiene and trends relating to workmen's compensation legislation. The legal responsibility of employers in these fields was stressed in his paper which covered: (1) trends in workmen's compensation, (2) the practical considerations resulting from a survey among New Jersey producers as to insurance rates in that state, and (3) prospective legislative changes applicable to the problem of impairment of hearing.

All of the state legislatures except four will be in regular session during the calendar year, said Mr. Waters, and countless bills will be introduced dealing with matters affecting industrial relations; of which workmen's

(Continued on page 125)

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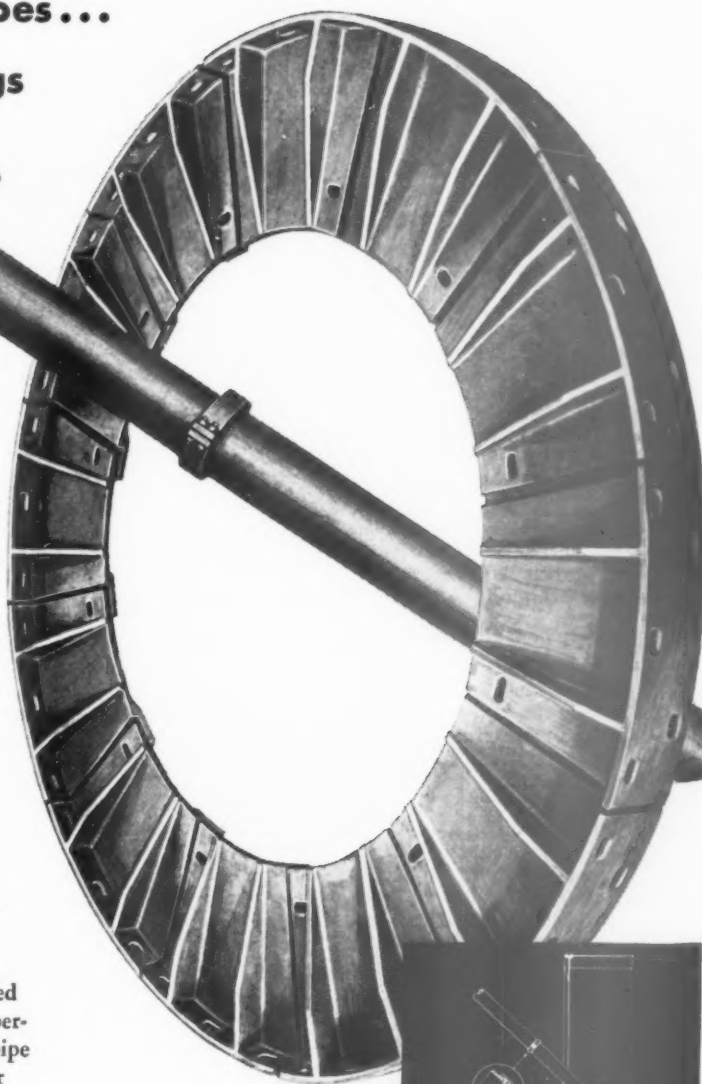
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Members of A.S.T.M., hard hats and all, visit Brandon, Miss., plant of Marquette Cement Manufacturing Co.

A.S.T.M. Committees Inspect Cement Plant and Concrete Research Laboratory

COMMITTEES C-1 ON CEMENT and C-9 on Concrete and Concrete Aggregates held their Fall meetings, October 4-8, at Jackson, Miss. Each committee had two days for sub-committee discussions and reports, with the day between set aside for an all-day guided tour of the Brandon, Miss., plant of Marquette Cement Manufacturing Co. and the Concrete Research Laboratory of the Corps of Engineers at Clinton, Miss.

Members were guests of Marquette Cement Manufacturing Co. for the entire day, including transportation, luncheon and dinner at the Jackson Country Club. Executive vice-president D. S. Colburn was official host for Marquette and Governor Hugh White was the featured speaker at the dinner.

A memorial tribute was paid in the main meeting of C-9 to R. B. Young, concrete consultant of the Hydro-Electric Power Commission of Ontario, who died August 24, 1954. Mr. Young had been a member of A.S.T.M. since 1916, had served as a member of committee C-1, and was a past president of A.C.I.

As for the technical sub-committee meetings, there was much interesting and some spirited discussion, and there was evidence of progress made toward developing and revising certain specifications. Greatest emphasis was on durability of concrete and, particularly, on the subject of chemical reactions of aggregate in concrete.

The sub-committee on chemical reactions of aggregate in concrete continued its discussion along the lines of the recent Chicago meeting (see *ROCK PRODUCTS*, September, 1954, pp. 86-87) at which T. C. Powers of the research laboratory of the Portland Cement Association had outlined a new theory to explain the mechanism of the cement alkali-aggregate reaction. Mr. Powers elaborated further in this meeting and it was felt that progress is being made toward greater understanding of the problem. Chairman W. C. Hanna resigned as chairman of the sub-committee (II-b) and Bryant Mather of the Corps of Engineers is to succeed him.

The sub-committee on durability of concrete likewise had a long discussion at which Mr. Powers made the greatest contribution. It was felt that much progress is being made and that great benefit is about to be gained as the result of P.C.A. research. No specific recommendations were made.

C-9 Sub-committee II-f on aggregate mineralogical characteristics as related to concrete, which had been instructed to prepare a specification for deleterious materials and method of determination of deleterious materials, had compiled a list of deleterious materials for consideration from a survey of state highway department specifications. They included alkalis, clay lumps, disintegrating pieces, friable materials, laminated particles, organic matter, shale, soft fragments and

• Fall meetings of Committees C-1 on Cement and C-9 on Concrete and Concrete Aggregates at Jackson, Miss., consider changes in specifications. Papers were presented on resistance of concrete to freezing and thawing, and on compressive strength tests of ready-mixed concrete

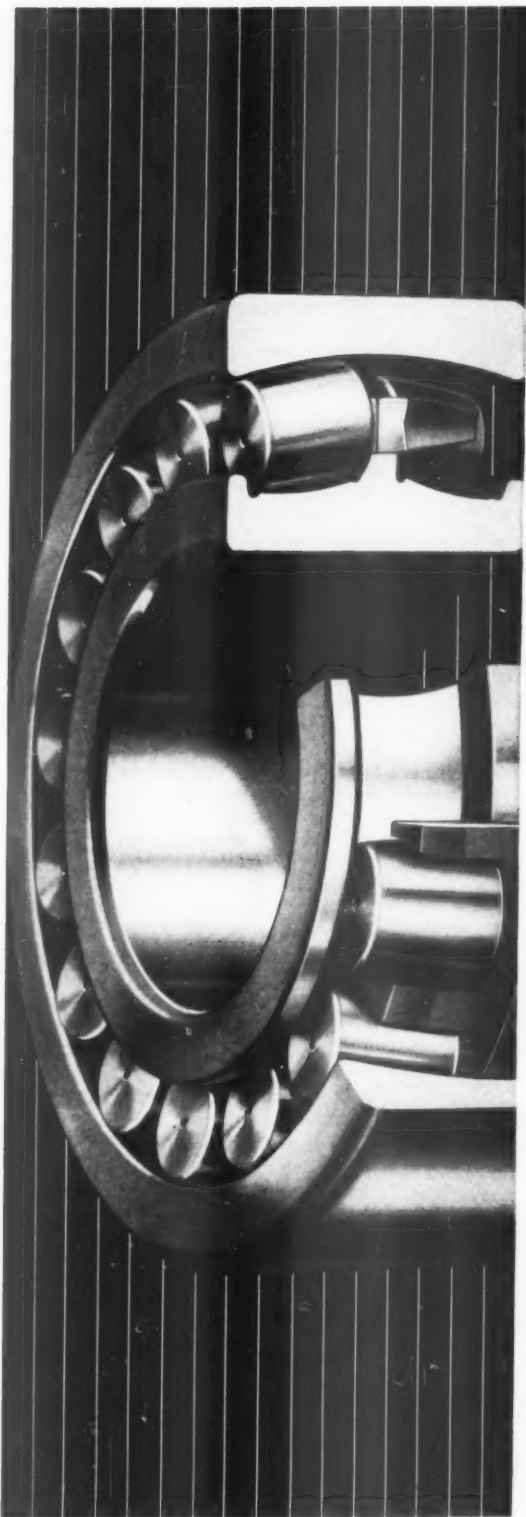
thin and elongated particles. These materials were charted according to their frequency of mention in specifications and will be used in carrying on the study. The sub-committee will approach the problem from the viewpoint of methods available for detection, and a generalization of the requirements for objectionable materials will be made. A method of test will be written around these requirements.

Sub-committee II-c on elastic and plastic properties of concrete discussed the results of a questionnaire and considers it desirable to evaluate available information on "creep." A bibliography on the subject will be prepared to start from, and a definition of creep is to be formulated.

Sub-committee II-G on the pore structure of aggregates has reviewed methods for determination and the next step is to consider how pore structure influences the durability of concrete.

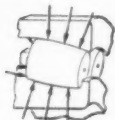
Sulfur capping provisions are slated for further improvement and standards governing test cylinders are to be a subject for further study by the sub-committee on testing concrete for strength. No action was taken by the sub-committee on volume changes of concrete and concrete aggregates. The sub-committee feels that a great deal of research is yet needed. The sub-committee on testing fresh concrete is reconsidering the Kelly penetration ball test with a view to possibly bring-

(Continued on page 112)



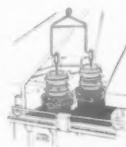
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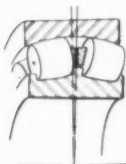
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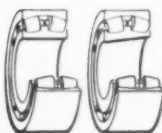
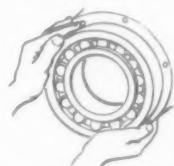
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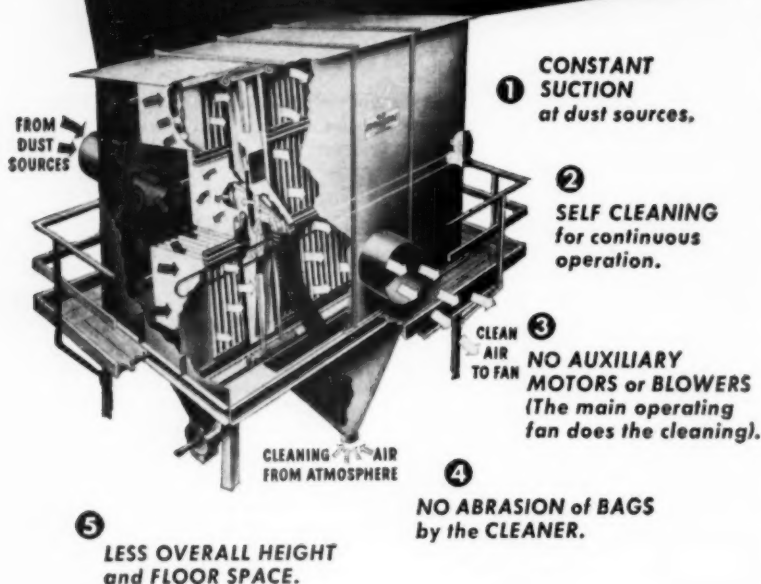
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A.S.T.M. Meeting

(Continued from page 110)

ing it up later in a tentative specification.

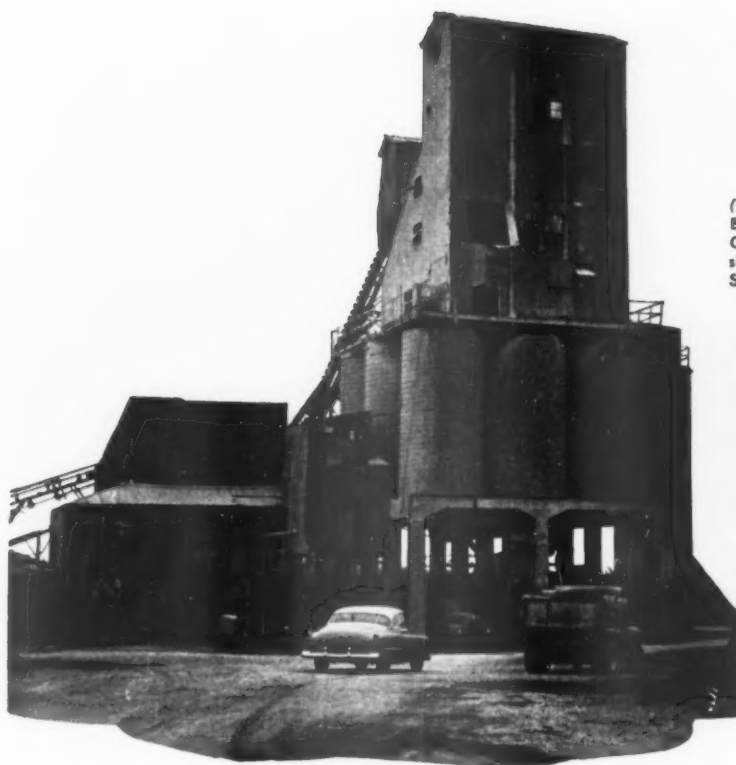
The sub-committee on specifications for aggregates had considerable discussion on the desirability of eliminating the 0.6 percent ceiling for combined alkalis in portland cement and on whether this limitation is insurance against unfavorable performance in concrete. It was brought out by T. C. Powers that combinations that produce reaction in the low alkali range are very rare. At present, reactive aggregate is permissible if alkalis, as sodium, do not exceed 0.6 percent in the cement. It had been proposed in the last meeting that the use of reactive aggregates be permitted only if a suitable pozzolan be used, but that proposal was highly controversial. The specification remains as in 1952 and the entire subject has been referred back to the working committee.

The sub-committee on methods of testing and specifications for admixtures has a great deal of work underway covering pozzolans, finely divided additives, air-entraining agents, damp-proofing materials and chemical agents. A first draft of a specification on natural pozzolans has been prepared, using particle size in preference to surface as a measure of size due to the wide ranges in specific gravities. Cooperative tests are to be made on the use of fly ash. A proposed specification on these two materials is headed for tentative status.

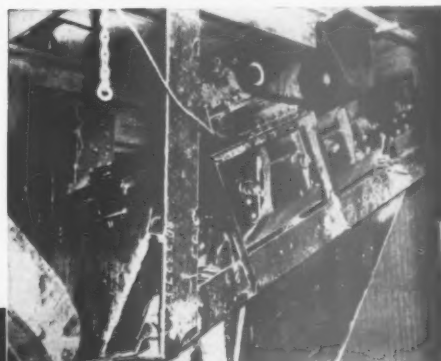
Principal activity of the sub-committee on testing setting time of concrete was discussion of the Proctor needle and the bond pull-out method. The latter will be tested and reported on at the next meeting since it appears to have merit and will be adaptable to economical field and laboratory use.

A first draft of a specification for packaged dry premixed materials for mortar and concrete has been prepared and substantial progress is underway toward preparing a specification. This will be reported on again at the next meeting when a second draft will have been prepared.

The specification for portland-blast furnace-slag cement which had been submitted for letter ballot came in for considerable and heated discussion and controversy over the percentage of MgO to be permitted in the slag, and/or in the cement. One cement manufacturer has been seeking to have the permissible limits raised. The advisory committee, as a result, passed a resolution that committee C-1 will not write a specification to cover a product not in use, nor will it make major revisions to existing specifications covering new or untried prod-

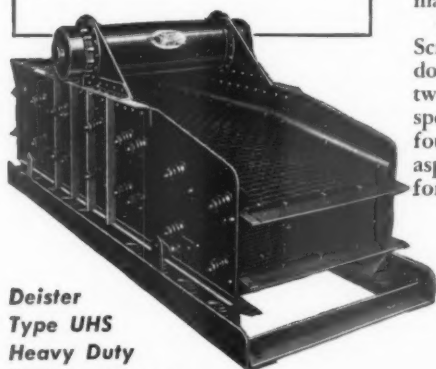


(Left) Exterior view of Genesee Stone Products Corporation, Batavia, N. Y., which has capacity of 1500 tons per day. Close-up (below) shows one of two Deister Type SL, 4' x 8' single-deck high-speed Ag-Lime Screens in use at Genesee Stone, equipped with 16 mesh cloth.



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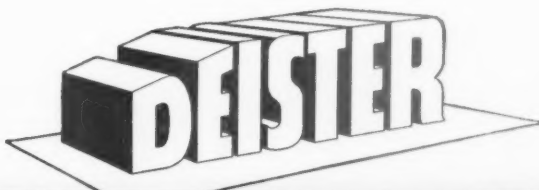
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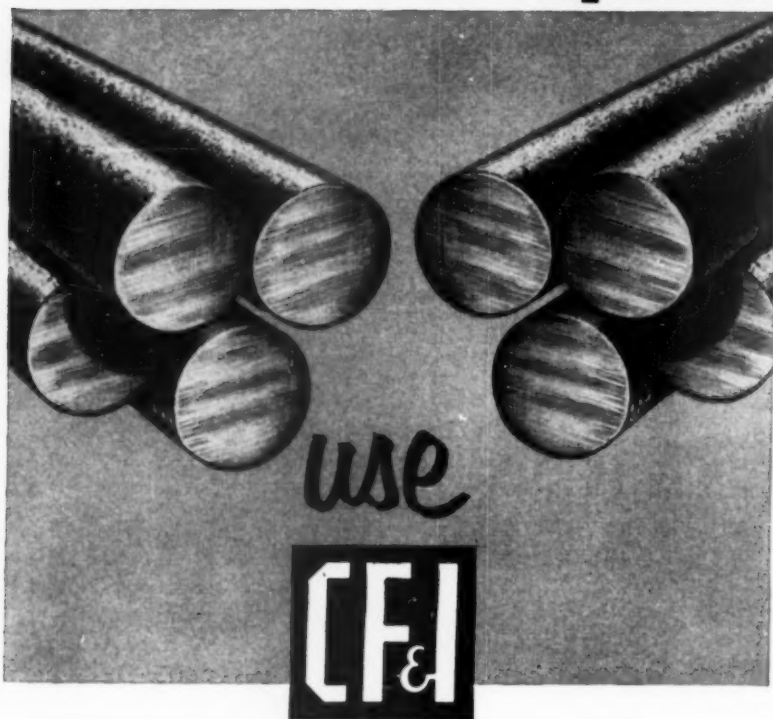
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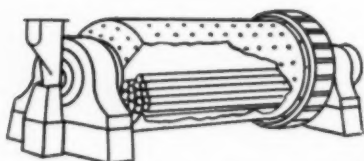
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ucts. It was pointed out that high early strength portland cement was in use for three years before a specification for it was written and that lumnite cement was marketed for 30 years without a specification.

The working committee on additions to cement, after hearing requests that a specification be written covering the addition of carbon black, ruled that it constitutes a localized problem and that it is not yet a subject for a national specification. However, no objection was made to its use in controlled amounts.

Working committee on strength (C-1) had compiled comprehensive data from cement manufacturers and testing laboratories to show a comparison of hand versus mechanical mixing in effects upon compressive strength, covering all A.S.T.M. types of cement. Higher strengths were shown to be obtainable with mechanical mixing for non-air-entraining cements, and the reverse was true for air-entraining cements. The large volume of data is to be reviewed with a view to recommending changes in strengths based on the study. The sponsoring committee on portland cement plans to delete type IV cement from the federal specifications, as being unnecessary.

A paper entitled "Observations on the Resistance of Concrete to Freezing and Thawing" by Hubert Woods, Director of Research, Portland Cement Association, presented some of the general conclusions that may be drawn on the subject, based on a survey and analysis of investigations. One definite conclusion is that normal water/cement ratio concrete, without air-entrainment, is susceptible to freezing and thawing when water soaked.

The location of damage resulting may be the aggregate, or the hardened cement paste, or both, and the damage is caused by the internal pressures from freezing which exceed the strength of the paste or aggregate. The pressure may be hydraulic, due to resistance of the cement paste to the flow of water displaced by the ice, or may result from the growth of ice bodies extracting water from the adjacent gel. Important insofar as the aggregate is concerned, is that there may be insufficient space available for the added solid volume resulting from freezing. The purpose of entrained air is to provide a multitude of separated air voids in the hardened paste so that excess water displaced during freezing has only a short distance to move for relief space.

It was brought out that accelerated freezing and thawing tests could be so conducted that air-entrained concrete which would be highly resistant

(Continued on page 116.)



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RP-5

in the field might show rapid destruction under test.

No commercial cement clinker composition or cement fineness shows up to significant advantage over others with respect to freezing and thawing. Entrained air in cement paste is not to be expected to eliminate the need for correct mix design or construction practices, neither should it be expected to compensate for bad aggregate.

A possible alternative for entrained air is in the use of low water/cement ratios of the order of 0.4 by weight. Such concrete, when well cured, would have no freezable water under normal exposure, some of the water being chemically combined and the rest strongly adsorbed.

The second of the two prepared papers was "Studies of Uniformity of Compressive Strength Tests of Ready Mixed Concrete" by Delmar L. Bloem, assistant director of engineering, National Ready Mixed Concrete Association and National Sand and Gravel Association. The paper was based on exhaustive tests made in 1952 by the N.R.M.C.A. in cooperation with the Truck Mixer Manufacturers Bureau on concrete truck mixers and on simultaneously taken control batches for laboratory study in order to make comparisons.

In controlled tests of ready-mixed concrete it was indicated that, where slump is maintained within usual tolerances, strength tests should be expected to have a coefficient of variation of about ten percent when conducted under standard testing procedures. Variations in weather and in the strength-producing properties of the single brand of cement (one was used) from shipment to shipment were probably about normal. The figure of ten percent variation could not be considered to apply where more than one brand or type of cement were being used or where there would be deviations from standard sampling and testing procedures. In actual field tests of ready-mixed concrete, under job conditions, coefficients of variation had a range from 7.0 to 14.5 percent.

The data indicate that tests of single cylinders yield strength values nearly as reproducible as tests consisting of averages for several cylinders but it was concluded that it cannot be assumed that this would hold under the less favorable testing conditions existing in the field. However, single-cylinder results could be used to indicate the level of strength and uniformity when done under conditions of proper supervision and interpretation. Conditions are probably never so favorable, on the other hand, as to permit the use of single-cylinder strength tests as a basis for acceptance of concrete under strength specifications.

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From similar reports it's clear that Motorola 2-way radio is enabling many ready mix operators to brush off headaches by the dozen. It establishes dispatcher control over most sit-

uations that would ordinarily develop into sure losses, quick re-routing to maintain close schedules, fast relief in breakdowns, better control of load estimates and deliveries, fewer unforeseen overtime penalties... all these factors are promptly controllable with Motorola 2-way radio.

Write or phone us at once for a Motorola engineer. He'll be glad to explain how for about \$1.00

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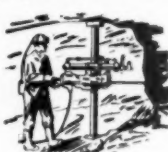
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Canadian Cement Shipments Show Big Increase

SHIPMENTS of portland cement by Canadian producers in 1953 amounted to 22,238,335 bbl., valued at \$58,842,022, both of which were new high records, according to the annual industry report of the Canadian Bureau of Statistics. Production in 1952 was reported at 18,520,538 bbl., valued at \$48,059,479.

Shipments in 1953 were larger in all producing provinces. Quebec's total shipments, highest of the seven, increased to 7,400,912 bbl. in 1953, from 7,272,241 bbl. in 1952, while Ontario's shipments totaled 7,078,181 bbl. in 1953, compared with 5,577,025 bbl. for the preceding year. Other province shipments were: Alberta, 3,098,664 bbl., up steeply from the 1952 figure of 1,886,544 bbl.; British Columbia, 1,826,543 bbl., up from 1,441,710 bbl.; Manitoba, 1,614,301 bbl., compared with 1,612,795 bbl. in 1952; New Brunswick, 823,900 bbl., compared with 604,123 bbl. for the previous year; and Newfoundland, 395,834 bbl., compared with 126,100 bbl. in 1952.

There was less cement imported but more exported in 1953 than in 1952. The imports totaled 2,428,783 bbl. in 1953, as against 2,913,981 bbl. in 1952, while exports in 1953 amounted to 14,728 bbl., compared with 4305 bbl. in 1952.

Gypsum Expansion

THE CELOTEX CORP., Chicago, Ill., has started an expansion and modernization program at its Port Clinton, Ohio, operations. The program includes construction of a new and larger gypsum board plant and expansion of its other plant facilities, as recently announced by Otis S. Mansell, president. The construction work is to be done without interruption to production. The company also operates gypsum plants at Fort Dodge, Iowa, and Hamlin, Texas.

Kaiser Gypsum Plant

(Continued from page 86)

board plant there is wastage of improperly made board that runs in square feet into the five to six figures. The Seattle plant started with a wastage considerably less than normal.

A neat and modern office is located adjacent to the main entry gate. This office is for the use of the general superintendent, sales and accounting departments.

Officials having principal responsibility for the operation of the new plant are: Carl R. Olson, vice-president of Permanente Cement Co., Kaiser

Gypsum Co., Inc., and the Henry J. Kaiser Co.; Wallace A. Marsh, vice-president and general manager of Permanente Cement Co.; Claude E. Harper, vice-president and general manager of Kaiser Gypsum Co., Inc.; John V. Pooler, general production manager for Kaiser Gypsum Co., Inc.; and Sam R. Witt, Jr., general superintendent of the Seattle plant. Mr. Witt joined the Kaiser organization in 1946 as a laborer at the Long Beach plant, and later progressively became foreman and wallboard superintendent. Howard Weightman is plant chemist and in charge of quality control.

Colin L. Campbell is general sales manager of Kaiser Gypsum Co., Inc., and Walter Lord is Northwest sales manager. Other executives of the gypsum company are: Victor E. Coe, assistant to the vice-president and general manager; Robert A. Costa, assistant general sales manager; Bryce W. Simpson, controller; John Berg, manager of Gypsum Carrier, Inc.

Others on the Kaiser Gypsum Co., Inc. staff at Seattle are: Jack Bristol, wallboard plant superintendent; Art Darling, mill superintendent; Don Shepard, loading foreman; Paul Tillsch, chemist; and Frank Crosby, public relations director for the northwest.

Head of the giant Kaiser industries is Henry J. Kaiser who is president and chairman of the board for Permanente Cement Co. and Kaiser Gypsum Co., Inc. The board of directors are: R. E. Trefethen, Jr., executive vice-president and treasurer, Permanente Cement Co.; Allen D. Christensen, president, Utah Construction Co.; Edward H. Heller, partner, Schwabacher & Co.; D. V. McEachern, chairman of the board, General Construction Co.; H. W. Morrison, president and chairman of the board, Morrison-Knudsen Co., Inc.; Gilbert J. Shea, president, J. F. Shea Investment Co.

Rocky's Notes

(Continued from page 53)

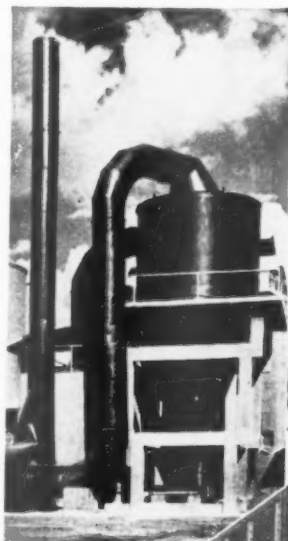
So, when the next convention at Montreal, Que., came about President Graves was able to announce a National Crushed Stone Association already set up to really serve and give prestige to a long-neglected basic industry. This convention owing to the times and the place was an especially convivial one, and it is doubtful if full realization of what had been accomplished by the new president was then comprehended. Anyhow, he was unanimously reelected, and the convention itself was a huge success.

As Otho himself recently recalled the circumstance, I was sitting beside him at a group luncheon meeting in

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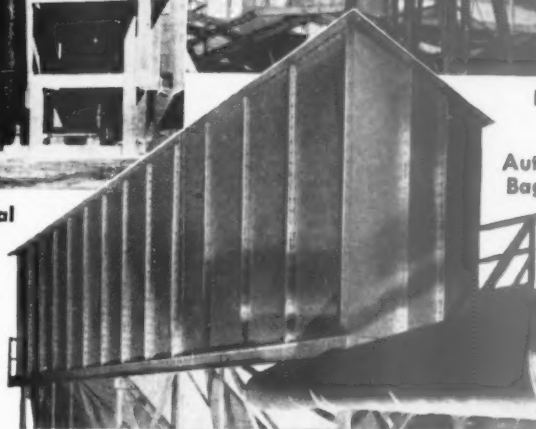
make outstanding records for high recovery with low operating and maintenance costs



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These three important types of Norblo collecting systems, frequently used in certain combinations, bring you economical, dependable control as required in a wide range of industries. "Guaranteed Efficiency" is not an empty phrase at Norblo. We stand back of every installation that's used for the purpose and at the capacity for which we designed it. All component parts are made by Norblo, under controlled specifications.

For more than 40 years Norblo has engineered and supplied installations of every size in the rock products, smelting, chemical, metal working, milling and processing fields. It pays you to get the facts about Norblo Dust and Fume Collecting Systems. Give us a description of your problems.

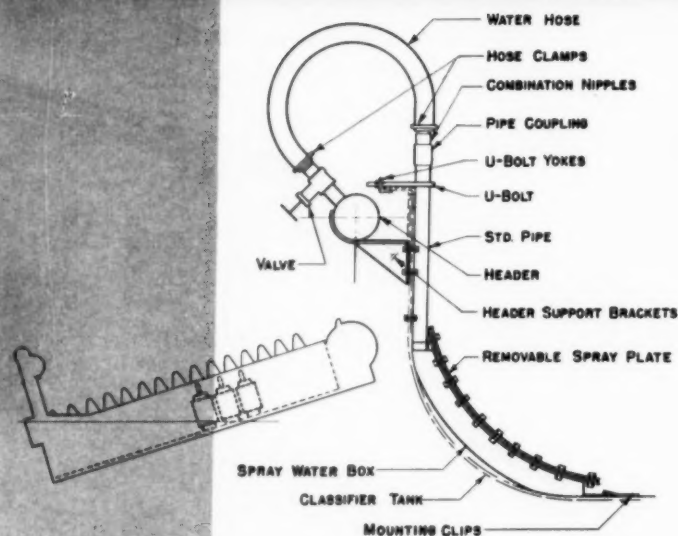
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solves difficult sand-washing problems



The Akins Spray Water Box was developed by Colorado Iron Works Co. in 1937 and has proved to be particularly valuable in cases where adhesion of slime particles to sand is so persistent that a clean separation cannot be made by normal classification.

Spray Water Boxes, generally furnished in multiple assemblies, are easily and quickly bolted to the standard Akins Classifiers and are placed at the lower end of the drainage deck. The top spray plate is gasketed and bolted for quick, easy removal and replacement when spray holes are blinded.

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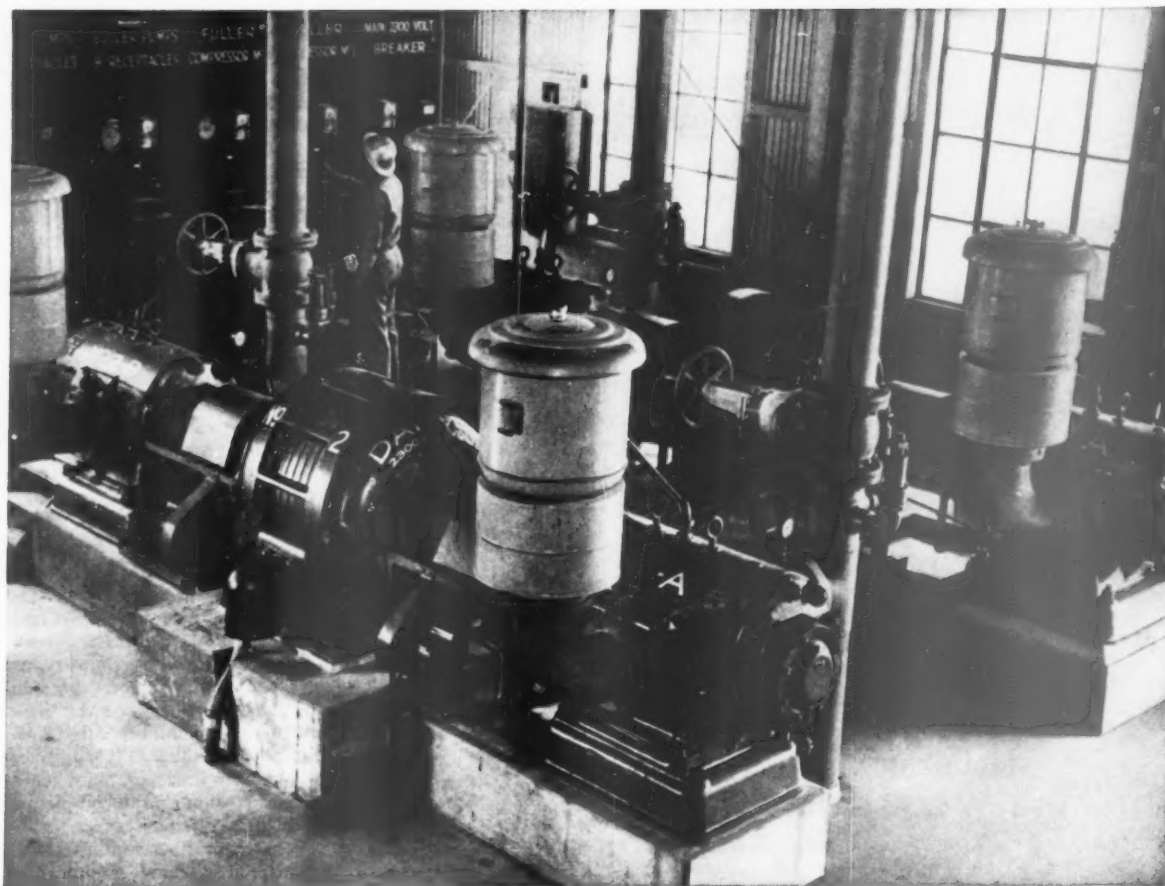
GLOUCESTER, MASS.

New York, the following summer, when I challenged him to give me some good reasons why any crushed-stone producer should join the National Crushed Stone Association. Although, of course, he knew I was baiting him, he launched into an eloquent talk to the point. He said that when he had finished, I told him that if he would go into the industry with the same arguments, the association would gain some new members. Be that as it may, the germ of a West Coast, cross-continent barnstorming trip was hatched there, and I was later asked to develop the plan, arrange meetings and itinerary.

On November 8, Otho, Goldy, Reg and myself left Chicago with stops and meetings scheduled at Madison, Wis., St. Paul, Minn., Omaha, Neb., Cheyenne, Wyo., Denver, Colo., Salt Lake City, Utah, Portland, Ore., San Francisco and Los Angeles, Calif., El Paso and San Antonio, Tex., and New Orleans, La. The local meetings were arranged by local producers, and the attendance was comprised more of highway and public works engineers than producers, for the simple reason that the crushed-stone industry was then and still is rather sparsely represented west of the Mississippi Valley. Nevertheless, the trip did the association a world of good in establishing national prestige and goodwill; and better representatives to establish these could not have been found than Otho with his gift for after-dinner eloquence, and Goldy with his prestige as a testing engineer.

We need not go into details of the trip other than to say it was one that no one of us ever forgot. We found everywhere the most cordial hospitality, and we found Otho a prince of traveling companions on this his first trip to the West Coast. He accepted the hospitality extended as naturally and as graciously as if he were the Prince of Wales himself. If it accomplished nothing else, it must have helped sell Goldy and Reg on the organization they had cast their fortunes with.

Otho continued to direct the destinies of the association as its president for three more years; there is no denying, as a benevolent autocrat. Then, under his continued watchful eye, he was willing to entrust the presidency to others, whom of course he was the dominant factor in selecting. By then the association was solvent and going places. Admittedly he was reluctant to surrender its direction; to the day of his death he never got over the conviction that the association was "his baby," and he loved it and believed it still needed him. The younger element probably never understood this attitude and often attributed his



Fuller Rotary Compressors operate with minimum maintenance cost

Fuller Rotary Compressors installed in the Permanente Cement Company's bulk-cement storage and ship-loading plant at Redwood City, California, do yeoman duty supplying air to the Fuller-Kinyon Conveying System installed in the plant. These two Fullers, illustrated above, are of the single-stage duplex type, each having a capacity of 2040 c.f.m., actual free-air delivery, with 40-lb. discharge pressure.

These compressors are kept busy. During the year 1953, the Redwood City plant shipped approximately 2-3/4 million barrels of cement; however, the Fuller Rotary Compressors supplied the air to the Fuller-Kinyon System for handling it twice—incoming to storage and outgoing from storage to ships—for a total volume of approximately 5-1/2 million barrels. And, this mammoth task was accomplished with a total maintenance cost of only \$130.00 for both machines!

Such operation is the result of two important factors: (1) equipment designed and built to give satisfactory service under all kinds of working conditions; (2) careful overall supervision of the equipment, and good house-keeping by the operating personnel in the plant.

In this operation it is highly essential that these compressors operate at the highest efficiency when ships are being loaded, because wharfage charge is \$2.00 for every minute the ship is tied up to the wharf, in addition to operating cost of the vessel.

Thousands of Fuller Rotary Compressors are operating in various industrial plants, giving unqualified satisfaction and service, day in and day out. They're built in single and two-stage units for capacities to 3300 c.f.m., pressures to 125 pounds. Write for Bulletin C-5A, for a complete description of these modern machines.

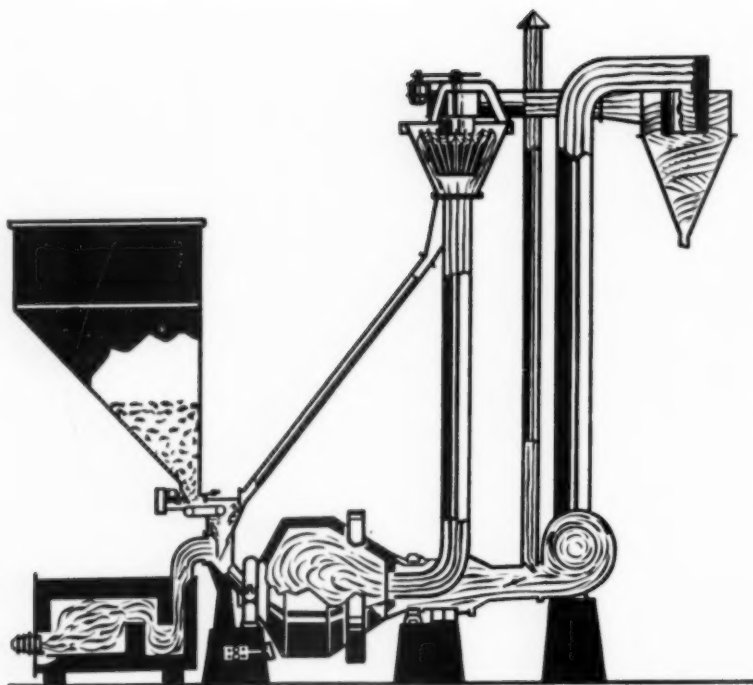
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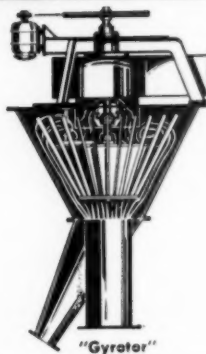
C-257
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**It DRIES
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The Hardinge "Thermomill" is an ingenious combination of Conical Mill, "Gyrotor" Air Classifier and air preheater. It dries, grinds and classifies—in a single system—materials carrying an appreciable amount of surface moisture, reducing them to dry, finely-ground products. Key item in the "Thermomill" is the new Hardinge "Gyrotor" Air Classifier, a separator with a wide range of fineness, controlled by simply changing the rotor speed. Overall classifier efficiency is higher than any attained by similar devices heretofore. Bulletin AH-449-7.



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ceaseless zeal and influence to less noble motives.

We need say little of his service as chairman of the Code Authority of the Mineral Aggregate Industries. It very much widened his acquaintance in the industries, and not always favorably. Too often, perhaps, he wanted things done his way. But all respected his ability to present an issue, even one that he had opposed with all his powers, as if it were his very own, and though privately convinced the approach was wrong. Obviously this faculty made him a pleader, par excellence. Even those who disliked him personally had to admit that a better selection to represent the industries could not have been made.

Industry Prestige

Until the day of his death Otho took over the organization of the convention programs. He was the perennial chairman of the program committee. In developing his programs he had one fixed idea that was never absent. When he came into the industry, it was one that few producers boasted of being in. In its early days the principal competition had been the state penitentiaries and other jails with their convict labor. So much so, that friends of the crushed-stone producers poked fun at them as "rock breakers," convict style. Obviously the industry was lacking in self esteem — almost in self respect. No doubt this was at once apparent to a young professor from the academic world. Otho set out to change this attitude of the producers toward their own industry, and one of the ways he conceived of doing it was to bring to the industry conventions specialists and famed orators "to raise the cultural tone of the meetings."

Otho never let go of this idea, although the time came when some of his associates believed it would be better to develop the growing talents within the industry itself — especially of the younger element which did not suffer any of the inferiority complexes of their predecessors. I believe much the same motives were present when Otho made his mark in the councils of the National Association of Manufacturers, the National Safety Council and other industry groups. He was determined to demonstrate that an executive of the lowly regarded crushed-stone industry was the equal of big brass in steel, oil or what have you. That he succeeded we all know.

Otho did so much in many ways for the industry to which he devoted his life work that it is impossible to recall here even a few of them. It should be remembered that he was the first to start a study of earth vibrations from blasting operations. Fortunately I was

present with him at the company's Winchester, Mass., quarry during some of these early experiments. There, and at many other times I shared his confidences and saw some sides of his character probably very few others did. He was generous in his praise of others talents; he was a master politician when it came to knowing how to use those talents. Speaking once of a contemporary, he said the mind of this man was far better than his own, because of this man's ability to think things through, where he didn't. Although he seldom or never gave that impression in public, privately he was genuinely modest in appraisal of his own worth.

Otho was active in association affairs up to the last day of his life because he could not have been otherwise. It was "his baby." He knew for several years his heart might give out at any time without warning. He told me he did not fear that kind of a death; but his doctor told him a stroke might not result in immediate death, that he might be paralyzed and linger on, bed-ridden. This he could never have endured; he was a man of active energy, he had to do things, his eloquence as an orator was a side issue. He lived as wholly as any man ever lived, and considering his life from all angles, he lived a full life and a long one, and he died as he would have preferred to die.

Slag Convention

(Continued from page 106)

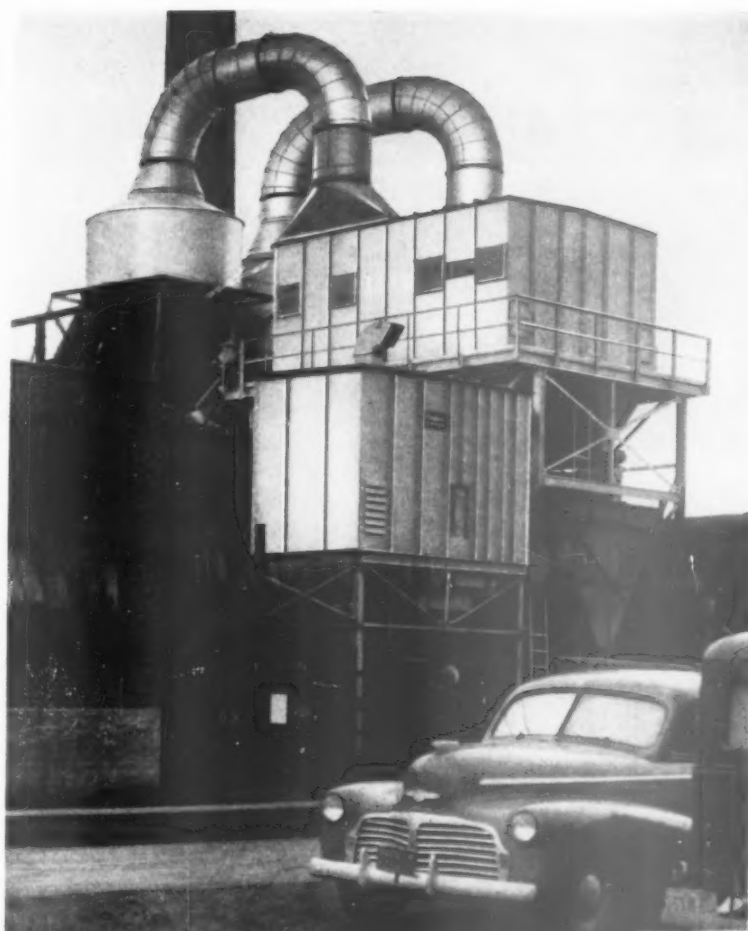
second is the evaluation of the quality of bituminous concrete by laboratory test methods which will require field as well as laboratory activity. The third project consists of fire tests of air-cooled slag concrete for the protection of steel columns and beams. No such official tests have been run so the use of slag for this purpose is not approved by the National Board of Fire Underwriters.

Business Reports

Current trends in slag utilization as reported by regions brought out, for most areas, that shortages of slag from the furnaces are the principal obstacle in efforts to keep up with demands for slag. In some areas with such shortages, the demands by the construction industry were reported as still on the upgrade. Railroad usage for slag ballast was reported as down in the Chicago and Colorado areas. Demands for lightweight slag aggregate were reported on the upgrade in some areas.

Russell E. Train, Clerk of the Committee, House Ways and Means, discussed the Internal Revenue Code of 1954.

Nearly all the discussion in the session for consideration of slag prob-



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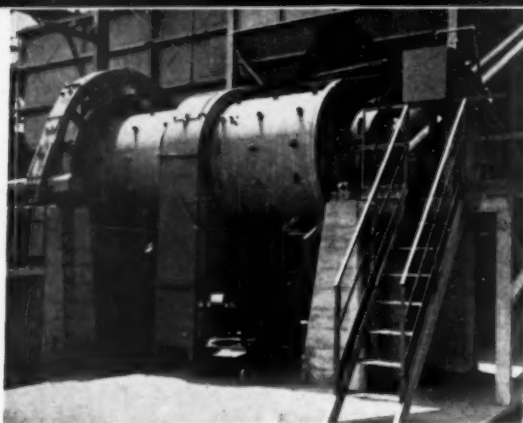
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lems was concerned with the possible uses for open hearth slag. The large majority of producers were not in favor of selling open hearth slag for most uses, including concrete or base courses, and some of the large producers will not recommend its use even for fill. Their stand is based on failures that have occurred, notably on a base course job in the Pittsburgh area.

Discussion by some of these producers brought out the risk of pop-outs in concrete and swelling when used as sub-base and in other uses where the construction is such that this slag be confined. In the Detroit area, this form of slag, when produced to 2-in. size or less, is used successfully for secondary roads, driveways and such "open" type of work but will not be sold for concrete or even for a base course in bituminous road work.

The one notable exception brought out was that open hearth slag is being used in the Chicago area with apparent success for many types of work, including concrete, which other producers do not advocate. Apparently, this slag has a higher silica content (35 percent) and proportionately lower lime content than the other slags, which reduces the effects of free lime. In production, seven stages of magnetic separation are used to remove magnetic oxides.

Asphalt

H. N. Snyder, The Buffalo Slag Co., Buffalo, N. Y., presided for a luncheon meeting at which J. E. Buchanan, recently appointed president of The Asphalt Institute was guest speaker. Mr. Buchanan told of the move of the Institute's headquarters from New York City to the University of Maryland and the research program to be undertaken there. He said that there are many new problems and developments to be faced which dictated the move. The University is erecting a building for the purpose which cost will be paid off by the Institute according to a lease arrangement.

Mr. Buchanan painted a rosy picture for the future in road-building. There are 3½ million miles of roads and streets of all types of which 850,000 miles are paved, which is totally inadequate. There are 1,220,000 miles of gravel or similar types of roads which constitute a large potential in the development of low-cost paved surfaces. Of 1,270,000 miles of earth or dirt roads, part can be developed to a higher type by using asphalt or cement-soil stabilization. It's a matter of up-grading the various road classifications to higher types.

He also mentioned the \$50 billion Eisenhower program for road-building, the 58 million vehicles that are choking urban areas, and the suburban

and rural bottlenecks to traffic which must be solved. He predicted an annual population increase of 3 million people and that there will be 80-85 million vehicles within the next 15-20 years.

Research will emphasize the low cost road, resurfacing and the design of mixtures for greater stability. New problems are constantly arising and he mentioned the impingement of hot gases from jet planes onto pavements as an example of challenges which must be met by research.

Industrial Sand Meeting

(Continued from page 108)

compensation will be one of the most important.

Mr. Waters quoted recent statements by Federal Secretary of Labor James P. Mitchell and Undersecretary of Labor Arthur Larson in order to emphasize the problems that employers must face in this field. Mr. Mitchell had publicly said, "Our object is to bring together all the information and facts in order to focus attention on those states where we think workmen's compensation is woefully inadequate." Mr. Larson had said, in part: "we still find ourselves in 1954 with a workmen's compensation program in this country that, in the view of most impartial observers, is inadequate, inefficient, and generally behind the times."

Mr. Larson made the following recommendations.

1. The payment of compensation based upon two-thirds of the employee's average weekly wages during the periods of permanent total, permanent partial, and temporary total disability without any maximums of week-benefits as now provided in practically all of the state workmen's compensation statutes.

2. Material increase in death benefits.

3. Elimination of any maximum benefit for medical and hospital care.

4. Elimination of "ceilings" on benefits for the respective types of disability.

To further emphasize the trend in thinking, Mr. Waters mentioned that the C.I.O. has prepared and proposed to recommend to every state legislature a complete revision of all workmen's compensation laws including drastic liberalization of all manner of benefits. This proposal, which is national in scope, was presented to the Legislative Council of Maryland in July, 1954. The proposals include the following:

1. The appointment of a labor representative as commissioner upon the administrative agency charged with the responsibility for administering the law.

(Continued on page 127)

WELLMAN "Williams" MULTIPLE ROPE BUCKETS

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THE double main hinge design of these WELLMAN "Williams" buckets gives you many advantages including: lower head room when boom or crane operations are cramped; stronger, more compact construction; and a really "long reach".

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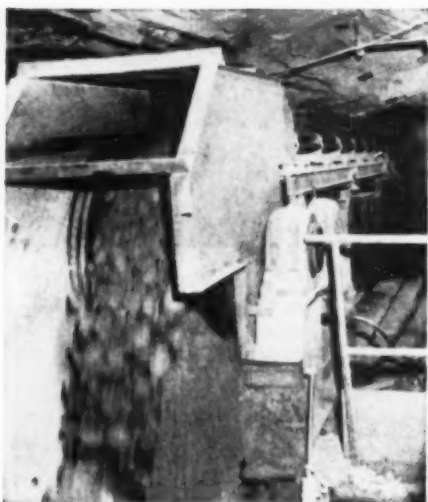
City _____ State _____

Position _____ Company _____



National Gypsum Company reports:

Belt reinforced with Du Pont "Cordura" rayon makes possible steady 10,000-ton-a-week production



Thinner, yet stronger than the conventional belt it replaced, this "Cordura" rayon-reinforced belt is 30 inches wide, 1,150 feet long.

The conveyor belt shown above is the only means of carrying limestone from the lower level of the National Gypsum Company mine in Bellefonte, Pennsylvania—steady production depends on it. The belt, reinforced with Du Pont Cordura* high tenacity rayon, gives top-notch performance during rugged 16-hour workdays . . . carries an average daily load of 2,000 tons of cold, damp limestone up a slope of 18 degrees.

The company reports that this "Cordura"-reinforced belt, manufactured by the Goodyear Tire & Rubber Company, troughs better than belts of conventional material . . . has given highly satisfactory, trouble-free performance since its installation.

The extra strength of Du Pont "Cordura" permits a belt that's thinner, yet stronger. And the low stretch of "Cordura" reduces expensive downtime for take-up and resplicing.

Write us for names of suppliers . . . and send for your free copy of the new booklet, "Mine and Quarry Facts About 'Cordura'." Address: Textile Fibers Dept., E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U. S. PAT. OFF.

Du Pont *"Cordura"* High Tenacity Rayon
STRENGTH AT LOW COST



REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

2. The payment of two-thirds of the average weekly wage of the injured employee during the term of disability without any limitation as to benefits so payable.

3. The payment of permanent total disability benefits for life.

4. The payment of temporary total and permanent partial benefits without ceiling as to weekly payments.

5. Material increase in benefits payable in death cases, including payment of compensation to widows for life and to all dependent children until they attain the age of 21 years, with increases in weekly benefits.

6. Deletion of the word "accident" from the Acts, the effect of which would be to make all "injuries" compensable.

7. The right of jury trials on appeals from the commission so that compensation cases on appeal would be tried in law courts with the employer denied of defenses.

It would be mandatory for state governors to appoint a nominee of labor as administrator according to Mr. Waters. The great majority of states now have a ceiling of a fixed number of dollars as a maximum payment. A probable effect of deleting the word "accident" from the Acts would, in his opinion, be to make all compensation statutes, health insurance statutes.

An actuarial study of this proposal made by the Maryland Self-Insurers' Association revealed that rates in Maryland would increase 300 percent if the law be enacted. Whether or not the Maryland legislature or any other state legislatures will agree to all of the requests, the fact that such bills will be proposed, along with the attitude of the Federal Department of Labor and the labor consciousness of state administrations, means that industry faces the most serious situation in this field of legislation in its history in the opinion of Mr. Waters.

He said that there will be a continuing extension of state departments of labor for the purpose of controlling hazardous conditions and the elimination of all industrial injuries, and that compensation costs will continue to rise. Any relief can only come through the elimination of hazardous conditions and eliminating injuries.

At the request of New Jersey producers, a study was made of their insurance classifications and the applicable rates, which revealed a substantial differential not only between the two classifications for silica grinding (Code No. 1741) and sand and gravel digging (Code No. 4000) but sizeable differences among the rates in each classification as applied to the separate companies.

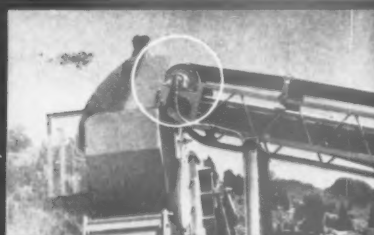
(Continued on page 128)

Save up to **90¢** of your
**CONVEYOR
MAINTENANCE
DOLLAR** with

Cedarapids

Sprock

Built by
IOWA



MOTORIZED HEAD PULLEYS

- No chains out in the weather and grit, so there's no chain failure, or chain idlers to keep adjusted and oiled.
- No V-belts to be constantly checked, adjusted and replaced.
- No shafts and drives to service and lubricate.
- No motors exposed to weather or damage.

ALL MOVING PARTS ARE INSIDE THE PULLEY SHELL

The reduction gears and electric motor . . . the only moving parts . . . are inside the pulley drum, fully enclosed and protected by the pulley shell. Wherever there are belt conveyors or belt-bucket elevator installations, Motorized Head Pulleys are the answer to your maintenance man's prayer.

THERE'S NO OTHER PULLEY LIKE IT! Call your Cedarapids distributor today about modernizing your plant with Motorized Head Pulleys.



**IOWA
MANUFACTURING COMPANY**
Cedar Rapids, Iowa, U. S. A.

Built for sale in Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah and Washington by
YUBA MANUFACTURING CO.
(Pulley and Sprocket Dept.) Benicia, Calif.

GYROSET VIBRATING SCREENS FOR

SIZING — DEWATERING

**POSITIVE ECCENTRIC ACTION
POSITIVE STROKE ADJUSTMENT**

**WITH ONLY
2 BEARINGS**



For scalping and for raw material sizing. A rugged two bearing positive eccentric screen. Adjustable as to stroke from 0 to $\frac{3}{8}$ " for efficient economical service.

PRODUCTIVE EQUIPMENT CORP.
2926-28 W. LAKE ST. CHICAGO 12, ILL.

... the new separable
**FLEXCO HINGED
BELT FASTENERS**



U. S. Patent No. 2,477,855

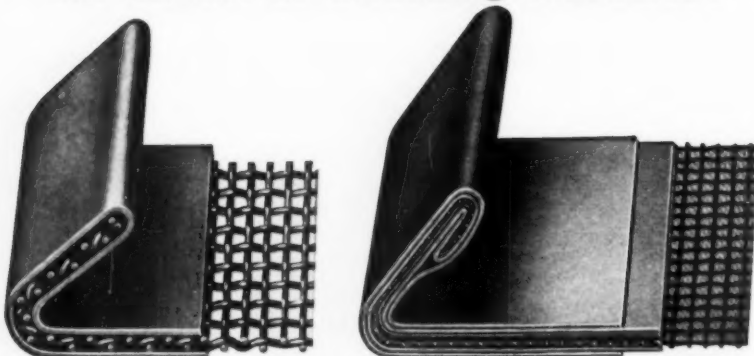
- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts $\frac{3}{8}$ " to $\frac{1}{2}$ " thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4684 Lexington St., Chicago 44, Ill.

**Tyler Screen Sections
for**

All Makes of Screening Machines!



Screen sections of Tyler Woven Wire are fabricated for all makes of vibrating screens in any mesh or metal. They are made up with hook-strip or bent-edge construction to suit the machine on which they are to be used.

Tyler hook-strips make possible stretching and maintaining the screening at drum-head tension, which is essential for successful screening and long screen life.

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO

Manufacturers of Woven Wire Screens and Screening Machinery

Industrial Sand Meeting

(Continued from page 127)

As a result of this study, made possible through the willingness of producers to exchange information, a comparison was possible with rates in other states and there was a basis for discussion of policies entering into the determination of rates with the insurance carrier.

Mr. Waters called the attention of New Jersey producers to the "Mine Safety Act" made effective July 23, 1954, which grants to the Department of Labor and Industry wide powers for the supervision and control of mining operations including "quarry, sand pit, gravel pit, clay pit and shale pit." It was suggested that producers read the Act and comply with its provisions including necessary reports as to the opening of mines, quarries and pits to the commissioner; notice to the commissioner of abandonment and discontinuance of operations; required notices in the plant in compliance with requisites for first aid and medical care; and compliance with the provisions applicable to hours of work and provisions of the Act applicable to safety and explosives.

The problem of noise in industry will be the subject of proposed legislation in nearly all industrial states in 1955, said Mr. Waters. To point up the trend in legislation, he referred to what has happened in Wisconsin and New York State.

In Wisconsin, an amendment to the law effective July 1, 1953, was enacted fixing a \$3500 limitation in benefits for impairment of hearing and requiring the claimant to show that he had sustained wage loss as a result. Similar legislation is contemplated in other states, but it is doubtful if similar enactments will limit the right to compensation where impaired hearing antedated the effective date of the amendment.

In New York State, the courts had ruled impairment of hearing to be compensable even though there be no accompanying wage loss. The flood of claims resulting caused the Industrial Commission to withhold the granting of awards for a period of six months after termination of exposure in order to evaluate the extent of the impairment. The eyes of other states will be on action to be taken in New York State.

Plant Conditions

Theodore F. Hatch, Industrial Hygiene Foundation, Pittsburgh, Penn., who had made a study of dust conditions at plants of member companies in 1946-1947, reported on a recently completed re-survey of conditions. His more recent study comprised visits to

19 plants located in south New Jersey, Ohio, Illinois, Michigan, Pennsylvania and West Virginia.

In the earlier report he classified the plants according to whether there was a dust problem and according to the adequateness of control measures where a problem existed. One of his general observations from his recent survey was that considerable progress had been made toward improving conditions.

He reported that he had seen very substantial changes in plant operations since his first inspection and that new operations in particular had very effective dust control features designed into them. Among some of the details observed and recommended were elevator doors that are designed so as to be hard to keep open, the use of bearings on the outside of housings, etc. The idea is to minimize the human element by making it difficult for workers to do wrong.

Good control principles as built into new plants should be incorporated into older operations, he said, which means the building of dust control into the operation whenever old facilities are in need of replacement, and he urged that producers share their experiences. He was impressed with the great progress made in bagging operations and in the solution of some problems that had hitherto been considered unsolvable. Another recommendation was that producers have available adequate, qualified medical service.

Taxes

Percentage depletion and other features of the Internal Revenue Code of 1954 were discussed by tax counsel John T. Sapienza. He first covered the subject of percentage depletion and particularly Revenue Ruling 54-443 as published on October 11, 1954, to define the term "quartzite" for purposes of the percentage depletion provisions of the Revenue Act of 1951.

So far as the Internal Revenue Service is concerned, the definition will apply for the taxable years 1951, 1952 and 1953 in the case of companies on the calendar year basis and to the period from January 1, 1951, to the end of the fiscal year ended in 1951, and to fiscal years ended in 1952, 1953 and 1954 for fiscal year companies. For subsequent taxable years, provisions of the Internal Revenue Code of 1954 are applicable.

The term "quartzite" is defined as including "any quartz rock of sufficient purity and such physical characteristics that it is used or sold for use as a refractory." It also includes "any metamorphysical or silica-cemented sandstone which has a free silicon dioxide content of at least 95 percent, is

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3-cu. yd. rapid shifter

THAT'S WHY

SAUERMAN SCRAPER MACHINES ARE JOB-ENGINEERED FOR YOUR PLANT

Your deposit may require a manually-shifted tail and bridle system or it may need a rapid shifter to make the many moves necessary in shallow pit operation or handling of non-caving material. If large capacities and long hauls are involved, a Sauerman Track Cable machine may best suit your needs. In the latter arrangement, the scraper bucket is attached by chains to a carrier traveling on a track cable. The bucket conveys its load at ground level and is discharged at the dumping point by merely tightening the track cable. Bucket and carrier guide glide back to the digging point at high speed when brake is released.

Sauerman scrapers work equally well on hills, boggy ground or in deep water. One man controls digging, hauling and dumping from a safe location, which may be as much as 1,000 ft. from the deposit. Sauerman machines cost less than many other types of excavators of similar capacities. Operating costs are very low, because you eliminate the power cost involved in moving heavy machinery around the area. A drag scraper maintains its efficiency for many years. When parts are replaced—sheaves, clutch or brake linings—the machine is restored to practically new condition, even though it may be twenty or more years old.



5-cu. yd. track
cable scraper

Write to Sauerman's experienced engineers about your plant

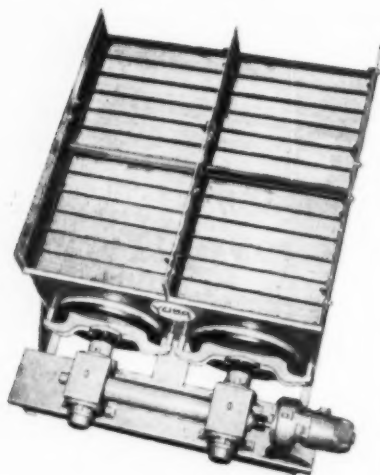
They will give you specific recommendations without obligation. Request Catalog A, Drag Scrapers—24 pages of job photos and specifications.

SAUERMAN BROS. INC.

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YUBA JIGS

for black sands



Handle any material that can
be concentrated, such as

CASSITERITE	RUTILE
GOLD	SCHEELITE
PLATINUM, ETC.	GARNETS
MONAZITE	SAPPHIRES
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YUBA jig action is positive. Just set to desired speed and stroke, get constant uniform pulsations that create surface action over full area of jig bed. Result: YUBA M-8 jigs have large material capacity per flow line under full control.

Stroke adjustments between 1/4" minimum and 3" maximum are easily and quickly made. Maximum frequency of a 4 cell M-8 jig is 350 at 1/4".

YUBA jig design saves space, increases production in new or old dredges or mills. Use to supplement existing jigs or replace other concentration methods. For details of adapting YUBA jigs to your operation, send us data on ore, feed sizes and present installation.

78



YUBA MANUFACTURING CO.
Room 717 • 351 California St. • San Francisco 4, Calif.

Industrial Sand Meeting

(Continued from page 129)

so firmly cemented that it tends to break across rather than around the original sand grains, has low porosity, and is used or sold for the purposes for which it is peculiarly adapted by reason of its chemical composition and physical characteristics."

Quartzite under this definition will be permitted 15 percent percentage depletion. If used or sold for use as "stone," 5 percent percentage depletion is permitted. The Internal Revenue Code of 1954 provides for an end use test but the Revenue Act of 1951 states nothing about end use. It is advised that companies interested in the quartzite definition seek counsel as to whether to accept or contest the end use test since their own conditions will have bearing. The end use test of the quartzite definition is to be tested by two sand and gravel companies. Several cases now in the courts (International Talc Co. and Cherokee Brick Co.), if they hold up, will make it easier for producers who pulverize sand to base their deductions on the sales prices of the pulverized product.

The Internal Revenue Code of 1954 does not throw light on the cut-off point, said Mr. Sapienza, but in most cases 15 percent depletion undoubtedly will apply for the industrial sand industry, since that figure applies if product be sold for their chemical content or for their refractory properties.

One important change in the law, said Mr. Sapienza, is the provision now permitting the aggregation of mineral properties for the purpose of computing percentage depletion. Whereas, formerly, percentage depletion calculations had to be made for each separate mineral property, separate properties that are part of an operating unit may be grouped for the purpose of calculation. Remote properties cannot be so grouped. Once a company has decided on grouping properties for the purpose, or to consider each separately, that practice is established and must be followed for all subsequent years. Because this is a permanent decision to make and because the decision may be a factor in future capital gains and losses, Mr. Sapienza stressed the importance of finding out the best way to make the computation.

The new optional methods for computing depreciation — the declining digits alternative — were described in detail. They are for the purpose of permitting faster write-off for depreciation than the old straight-line method provided. The declining balance method permits recovery of two-thirds the cost of equipment or plant in the first half of its life. Sum of the digits

method permits 70-73 percent recovery of the cost in the first two-thirds of the life of a facility. Mr. Sapienza believes the declining balance method generally to be preferable.

These new methods do not apply to depreciable property acquired before December 31, 1953, and a property must have a minimum life of three years in order for them to apply. They apply only to new machinery, and to building additions and remodeling.

The handling of operating losses, cash discounts, injury claims and other features as set forth in the code were briefly discussed.

Washington Report

Executive secretary V. P. Ahearn, in his informal talk on the Washington scene, said that President Eisenhower's hold on the people continues undiminished but he predicted that the House, nevertheless would go Democratic in the 1954 Fall election and that there would be a toss-up for the Senate. His predictions were correct.

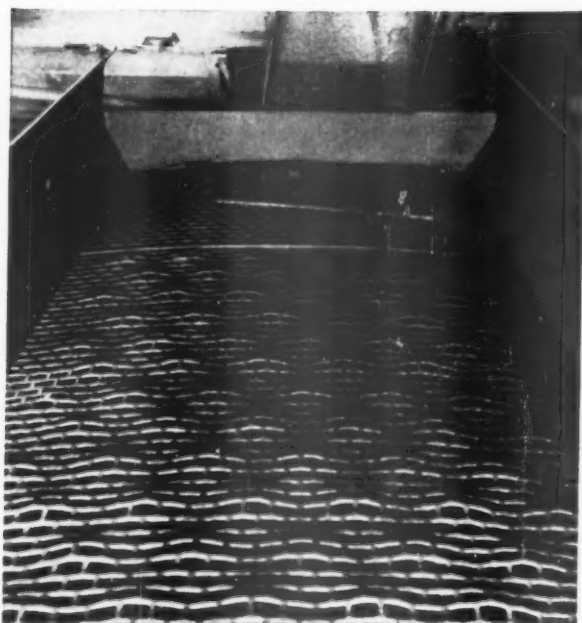
Insofar as effects of the election are concerned, Mr. Ahearn said that Democratic control would not result in much change in policies due to seniority rule, the South being "New Deal" and having had the chairmanships of important committees for a long time. Factors that would enter into the loss of control of Congress by the Republican Party, he said, are the employment situation, the decline in agricultural prices, drought conditions, the McCarthy controversy and apathy of the people. He predicted that President Eisenhower would run for re-election in 1956.

Clay and Shale Meeting

THE EXPANDED CLAY AND SHALE ASSOCIATION recently held its semi-annual meeting. The association was formed in January, 1954, with the following officers: Glenn C. Barnes, Onondaga Brick Corp., Warners, N. Y., president; A. Starling Johnson, Carolina Tuff-Lite Corp., Salisbury, N. C., vice-president; Lucas E. Pfeifferberger, Alton Brick Co., Alton, Ill., secretary; R. Neil Christy, Marietta Concrete Corp., Marietta, Ohio, treasurer; and R. A. Utiger, Cinder Concrete Products, Inc., Denver, Colo., publicity chairman. The association's twelve active aggregate producers form the board of directors.

Sand and Gravel Plant

VERMONT SAND & GRAVEL CORP., Rockingham, Vt., has opened a new plant at Walpole, N. H., for the production of washed sand and gravel. Plant capacity is 1000 tons per day. Owner of the company is Frank Whitcomb. Gilman Frye is plant superintendent.



Hendrick

MANUFACTURING COMPANY

47 DUNDAFF STREET, CARBONDALE, PA.

Sales Offices in Principal Cities

Takes a beating and comes back for more!

No matter how tough the screening job, Hendrick Perforated Plate stands up longer, yet affords more accurate sizing. No other screening medium can top it for uniformity of mesh, for non-blinding clearance and for long, trouble-free service life.

Decks can be changed fast and efficiently cutting time and labor costs. Available in any desired shape and size of perforations in high carbon steel and stainless steels and other commercially rolled metals, Hendrick Perforated metal is supplied flat or corrugated. For more details write Hendrick, today!

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids



Cracked Mantle such as this can be repaired



Same Mantle as above after crack has been repaired and then rebuilt with "MANGA-KOTE" MANGANESE Nickel Steel Electrodes

For quick and economical repair of worn equipment use "MANGA-KOTE" MANGANESE Nickel Steel Electrodes

"MANGA-KOTE"

AC or DC Welding Electrodes

11½ to 13% Manganese Nickel Steel

It's New! Gives you all the advantages of tough, ductile manganese nickel steel weld deposits, yet runs as easily as mild steel electrodes.

It's Fast! Eliminates all the special techniques of application required in welding manganese nickel steel. Requires no Peening.

It's Versatile! Makes a perfect bond on all types manganese, carbon and nickel steels.

Welds in all positions. Joins dissimilar metals.

Welders—order MANGA-KOTE from your nearest distributor. Name on request.

RESISTO-LOY COMPANY, INC.

Grand Rapids 7, Michigan

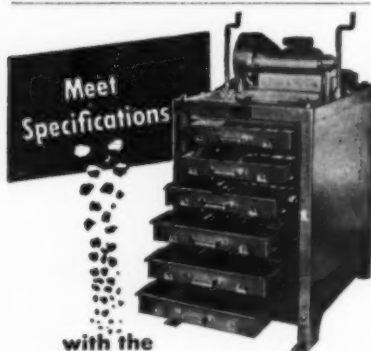
STEEL

quick delivery

Ryerson

Plates, Structurals, Bars,
Sheets, Tubes, etc.
Carbon, Alloy, Stainless
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Ryerson Plants: New York, Boston, Philadelphia,
Charlotte, N. C., Detroit, Cincinnati, Cleveland,
Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis,
Los Angeles, San Francisco, Seattle, Spokane.



Gilson Testing Screen

The GILSON Screen cuts out error and guesswork in meeting sizing specifications for crushed stone, gravel, slag, coal, ores, and similar materials.

You can own and maintain a GILSON Screen for only 65-cents per 1,000-ton production in your plant, according to our sales and service records.
For Research Projects, too — the GILSON Screen is the answer to moderate-scale mass separation jobs.

WHY THE GILSON SCREEN?

1. Makes test quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

GILSON SCREEN CO.
MALINTA, OHIO

National Safety Congress

(Continued from page 102)

of plant organization and operations as a whole and it was concluded that satisfactory results could be achieved only by means of a well-balanced and coordinated program which would give full consideration to the following objectives:

1. Establish accident prevention as an integral part of every production operation.
2. Make maximum use of engineering to create and maintain a safe working environment.
3. Promote the use of personal protective equipment to prevent injuries from hazards which could not be controlled by mechanical means.
4. Establish a broad educational and safety training program for all personnel.

Mr. Farmer referred to the considerable amount of construction and reconstruction around cement plants in the last 10 years as having eliminated many hazards. He declared that there are many improved facilities which "indicate that engineers have devoted a considerable amount of time and attention to the problems of bringing the workman and his job together with the least possible exposure to hazards.

"Material handling as associated with maintenance and repair is the life blood of cement plant operation, and over the years this work has contributed a major portion of all accidents.

"In recent years there has been a sharp increase in the use of mobile power equipment such as tractors, trucks, lift and fork trucks, mobile cranes and hoists to lift and transport all types of maintenance equipment throughout the plant. Engineers have been required to design and lay out buildings and working areas to accommodate free use of mobile equipment.

"By means of fork trucks and pallets, kiln brick can be placed directly on the kiln floor and in some plants, directly on the job inside the kiln. Mobile cranes can remove motors, gear reducers, gears, rolls and shafting from storage and place them in position on the job with a minimum of hand handling.

"Recent construction has also provided a variety of additional built-in facilities for handling heavy parts around mills, kilns and crushers. Several overhead cranes have been installed for the largest equipment. On lighter installations both power and hand-operated hoists have been placed at strategic points to handle parts and supplies. In still other areas steel trolley beams fitted with carriages to accommodate chain and rope falls have been incorporated within the building

FARREL-BACON JAW CRUSHERS SIZES 60" x 48" to 10' x 7'

Optional design features include: (1) Meehanite frame, sectionalized when necessary; (2) removable water-cooled bearings; (3) improved design of swing-jaw bearing; (4) forced-feed oil lubrication, or circulating system if desired; (5) split flywheels; (6) flat or V-belt drive. Write for further details or engineering assistance.

FARREL-BACON
ANSONIA, CONNECTICUT

You're Sure with Merrick



FOR Positive Controlled
Feed by Weight of Sand
Gravel, Lime Clinker,
Gypsum or other materials to Process—

Use the Feedweight

Merrick Scale Mfg. Co.
Passaic, New Jersey

structure. These lifting devices have eliminated many well known hazards associated with older methods which required the use of elaborate rigging."

Mr. Farmer referred to the screw conveyor as an old and faithful but extremely hazardous machine. "It is possible," he said, "that screw conveyors have inflicted more maiming injuries than any other single type of equipment in the industry." He said that improved designs and better maintenance have reduced screw conveyor hazards.

"One of the most important contributions to screw conveyor safety was made three years ago," Mr. Farmer said, "when a member company announced their own engineering standard which specified that continuous grating be installed beneath the solid cover and throughout the length of each conveyor. These designs were made available to all member companies."

The speaker referred at some length to the hazards of sliding material in large storage bins and the fact that traditionally such bins had flat bottoms. "There have been several changes in the design for silo bottoms," Mr. Farmer said, "but until recently none of the designs completely eliminated the old method of removing material. About five years ago, a member company designed and built the first battery of cement storage silos with steel cone bottoms, and it appears that this adaptation of an old engineering principle has solved a safety problem."

On Tuesday, Oct. 19, members of the Cement and Quarry Section attended a Joint Luncheon with the Coal Mining and Mining Sections, at the Conrad Hilton Hotel. J. T. Ryan, Jr., president of Mine Safety Appliances Co., Pittsburgh, Pa., presided.

Gil G. Grieve, National Safety Council staff representative for the three sections, was presented with a testimonial plaque for his "helpful and efficient service." The presentation was made by M. C. M. Pollard, General Chairman of the Cement and Quarry Section.

Elect New Officers

New officers of the Cement and Quarry Section were elected on Wednesday. These are: general chairman, Ted W. Jones, New Haven Trap Rock Co., New Haven, Conn.; vice-chairman, Howard Riefenstahl, safety director, Alpha Portland Cement Co., Easton, Pa.; second-vice chairman, Wallace Wing, president Marblehead Lime Co., Chicago; Kent Jander, chemical engineer, National Lime Association, Washington, D. C. and Ken Tobin, assistant secretary, National Sand & Gravel Association, Washington, D. C.

TRIM WASTE LINES



When it comes to getting rid of waste in mining, you can depend on light-weight Naylor pipe to do the job. It's easy to handle and install. And with Naylor, it's a simple matter to run lines wherever they're needed, particularly with the Naylor Wedge-Lock coupling that makes for the fastest possible connections, especially where space is limited. For sludge and tailings, air or water, you'll do better with Naylor pipe. Write for Bulletins No. 507 and No. 513.

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Eastern U.S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

MANUFACTURERS NEWS

IOWA MFG. CO., Cedar Rapids, Iowa, has announced election of the following officers: Howard Hall, president; Kenneth Lindsay, executive vice-president and director of sales and advertising; James F. Plumb, vice-president and treasurer; B. T. Perrine, secretary; A. C. Gossard, vice-president and domestic sales manager; C. O. Norberg, vice-president of parts and service; H. C. Pollitz, vice-president of engineering; and J. W. Riley, vice-president of production.

CLARK EQUIPMENT CO., Battle Creek, Mich., has appointed Eureka Boiler Works, Eureka, Calif., as distributor for the industrial truck division in California counties of Sisikyou, Del Norte, Humboldt, Trinity and Mendocino.

BLAW-KNOX CO., Pittsburgh, Penn., has announced an improved parts and service department at Springdale, Penn., for expediting shipment of replacement parts to customers of the construction equipment division. S. M. Pare is manager of the department.

KOEHRING CO., Milwaukee, Wis., has appointed W. L. Johnson Machinery Co., Midland, Texas, as distributor for the west Texas area including all counties west of and including Lipscomb, Hemphill, Wheeler, Collings-

worth, Childress, Cottle, King, Stonewall, Fisher, Nolan, Runnels and Concho; also counties north of and including Loving, Ward, Crane, Crockett, Irion, Tom Green and Concho.

ST. REGIS PAPER CO., New York, N. Y., has appointed Dean G. Abercrombie as manager of the Buffalo, N. Y., office of the multiwall packaging division. He succeeds Kenneth L. Moore, who has resigned.

GENERAL ELECTRIC CO., Syracuse, N. Y., has announced the appointment of Neal F. Harmon as southwestern regional manager for communication equipment, with headquarters in Dallas, Texas. His territory covers the states of Texas, Arkansas, Louisiana, Mississippi, Oklahoma and southeastern New Mexico.

THE GALION ALLSTEEL BODY CO., Galion, Ohio, announces the appointment of George J. Bockmann as northwestern regional sales manager. He was formerly southeastern district manager of the St. Paul Hydraulic Division of Gar Wood Industries, Inc.

THE JEFFREY MFG. CO., Columbus, Ohio, has announced the following appointments: Walter J. Hulsey, district manager of the conveyor division, Birmingham, Ala., with J. Thomas Berg as sales engineer; Howard S. Davies, conveyor division district manager in Pittsburgh; James B. Green,

conveyor division district manager in Chicago; E. E. Balduff, sales engineer, transferred to Orlando, Fla.; Travers W. Nelson, manager, Jacksonville, Fla., district office; William A. Cheney, sales engineer, New York, N. Y.; Vernon L. Ekblad, sales engineer, general engineering sales division, Houston; Robert F. Farrell, sales engineer, Columbus; Robert D. Henning, sales engineer, products engineering sales division, Columbus; Robert M. Dunn, sales engineer, Knoxville district office; George S. Kepley and Edward G. Braun transferred to Pittsburgh district office.

ATLAS POWDER CO., Wilmington, Del., has announced the appointment of Edward J. Goett as director of the newly-created commercial development department. He was formerly manager of sales development of the Charles Pfizer Co.

COMBUSTION ENGINEERING, INC., Chicago, Ill., announces the sudden death on June 8 of W. O. Hinkley, director of the testing laboratory of the Raymond division. He had been with the division for 17 years.

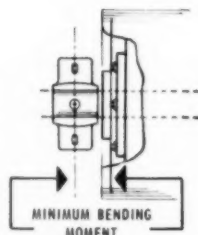
JOHN A. ROEBLING'S SONS CORP., Trenton, N. J., has appointed Edwin F. Whitehill as Cleveland district manager for the wire and cold rolled products division. He formerly served the Michigan and Indiana territory.

Take this step to insure pulley keyseat alignment

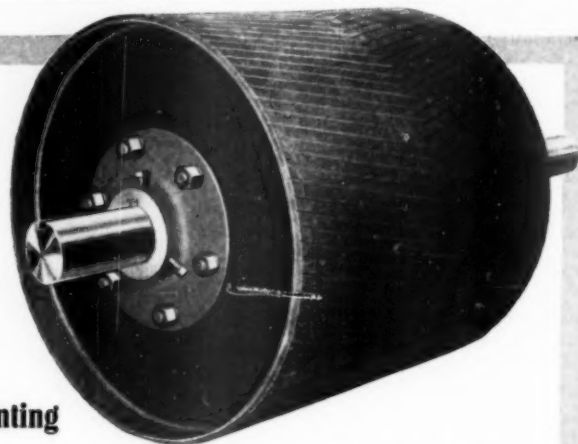
Get LINK-BELT factory-assembled pulleys
and shafts—take the work out of field mounting

IN addition to speeding field assembly and assuring alignment, Link-Belt factory-mounted pulleys have flush-hub design. The resulting minimum shaft deflection means better belt conveyor operation for you.

Whether your job calls for straight or crowned face . . . plain or herringbone vulcanized lagging—Link-Belt has popular sizes in stock. Call your nearby Link-Belt representative today for complete information.



Flush hubs minimize deflection, cut hub bolt stress and disc deflection.



Link-Belt line includes welded steel and gray iron pulleys as well as welded steel slat pulleys. Choose from bolted or taper lock hubs.

LINK-BELT

WELDED STEEL CONVEYOR PULLEYS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1, To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13-433-A

CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

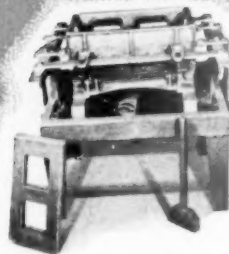


Pipe being placed in storage at Sherman Concrete Pipe Co., Knoxville, Tenn.

Another **BESSER** Booster★

★ This is the 112th of a series of ads featuring leaders in the Concrete Products Industry who are stepping up block production with Besser Vibrapacs.

Hand operated block machine, using corod pallets, designed and built by Besser in 1904.



Ed Olsen, President of Badger Concrete Co., discussing block production with his son, Frank. Standing, is Joe Mueller, Secretary.



Haydite Vibrapac Block were used in the construction of Olsen residence. Note accentuated horizontal joints.

Two Progressive Firms Associated with Concrete Block Industry Since 1904

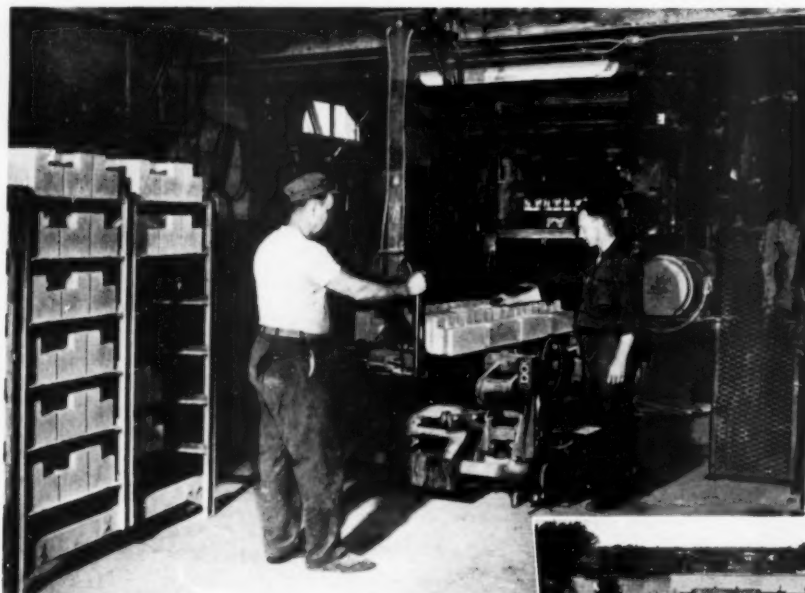
Badger Concrete Company, Oshkosh, Wisconsin, began to manufacture concrete block in 1904. That was the year Besser introduced the first hand-operated block machine. So 1954 marks the 50th Anniversary of both companies.

Ed Olsen, President of Badger Concrete Company, is very enthusiastic about the performance of his Besser Vibrapac Front Pallet Feed block machine. He carefully investigated other machines in the field and decided on Besser as best suited in his plant.

In addition to conventional block, Badger Concrete Company manufactures roof slabs, cast stone, shower trays, pipe, burial vaults and filler block for floors and roofs. All Badger products must conform to rigid quality standards. Distribution extends to a radius of 25 miles from Oshkosh.

BESSER COMPANY • Box 135 • Alpena, Mich., U.S.A.

Complete Equipment for Concrete Block Plants



VIBRAPACS ARE VERSATILE!

The flexibility of the Besser Vibrapac, and the advantage of the original Besser principle of making all sizes and types of block on ONE set of Plain Pallets, enables the Badger Concrete Company to supply a wide variety of block for the entire building. Shown here is the Vibrapac producing 8" header block. Inspector is checking height for uniformity.



(right) Yard scene at the Badger Concrete Company plant in Oshkosh. Note stock piles of Vibrapac Block produced with Besser Vibrapacs.



A Half Century of Concrete Masonry Progress!

INDUSTRY NEWS

Large Concrete Pour

ARROW SAND & GRAVEL CO., Columbus, Ohio, recently supplied ready-mixed concrete for a new electric powerhouse plant addition in Columbus, Ohio, which called for 10,000 cu. yd. of concrete, including eight monolithic foundation mats, 4 ft. 6 in. thick, for heavy generating equipment. The largest of these reinforced concrete mats, measuring 56 ft. 10 1/4 in. x 66 ft. 9 in., required 635 cu. yd. of concrete which had to be poured in one day. To meet this schedule, Arrow Sand and Gravel Co., with its ready-mixed concrete hauler, the Anderson Haulage Co., placed all of its Jaeger truck mixers in operation, plus four additional units supplied by Columbus Ready-Mix Corp. Of the 28 mixer trucks used, ten were 3-cu. yd. units and 18 were of 4 1/2-cu. yd. capacity. The mixers were batched at three different plants, including Arrow's Sandusky and Grandview plants, and Plant No. 2 of Columbus Ready-Mix Corp. The trucks averaged a 15-mile haul from the batchers to the pouring site, and the pouring was at the rate of 98 cu. yd. per hour.

Opens Ready-Mix Plant

KOST BROTHERS, INC., Moorhead, Minn., a ready-mixed concrete and concrete products firm, recently started operation of a new ready-mixed concrete plant at Fargo, N. D. Five transit-mixer trucks are operated from the new plant which has a daily capacity of 400 cu. yd. of concrete. Plans are also in progress for the establishment of a concrete products plant in Fargo.

The company retains its main plant at Moorhead and, in addition, operates three other plants. A plant at Downer, Minn., was opened in 1930 for the production of washed sand and gravel, and was later expanded to include the production of concrete brick and block. Another concrete products plant, established in 1935, is operated at Glynndon, Minn.

Founders of the company were John, Anton and Adolph Kost. John Kost is president of the firm and his son, Ronald Kost, is secretary-treasurer. Anton and Adolph Kost operate the Downer plant.

Modernizes Block Plant

JOSTEN CONCRETE PRODUCTS CO., Sioux Falls, S. D., has installed new automatic machinery at its block plant at Sioux Falls. The plant now has a capacity of 6000 concrete block daily and serves dealers, contractors and retailers in South Dakota and parts

of Minnesota, Iowa and Nebraska. In addition to concrete block, the company also produces septic tanks, burial vaults, precast steps, down-spout splash block, window areaways and Haydite block. The company was founded in 1916 by J. M. Josten.

Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER is shown the yard storage facilities of Sherman Concrete Pipe Co., Knoxville, Tenn. The company produces pipe ranging in size from 10-in. to 84-in. diameter and up to 96 in. in length, with the largest weighing 20,000 lb. Common sizes are 18-in. diameter pipe weighing 604 lb., and 66-in. diameter pipe weighing 7990 lb. Three Clark-Ross fork trucks are used to handle the pipe into storage and for shipping.

Concrete Pipe Air Ducts

AN UNUSUAL USE for concrete pipe was recently announced by the American Concrete Pipe Association which reports that 2700 ft. of 24-in. dia. reinforced concrete pipe have been installed as air ducts at the textile plant of Borden Mills, Inc., Kingsport, Tenn.

Dust, grime and high humidity normally associated with fabric-weaving operations have been eliminated by a system of blowers, ducts and air conditioning equipment which maintain optimum moisture conditions for the warp yarn without raising general humidity of the room above the comfort level. Clean, warmed, moistened air is sucked through the warp yarn to remove excess lint. The concrete pipe ducts which transport the lint-laden air to an air cleaner are painted with Bondex cement paint to provide the smooth finish required.



Reinforced concrete pipe are installed as air ducts at textile manufacturing plant

CONCRETE SUPPLY CORP., St. Albans, W. Va., formed recently by James L. Coleman, L. S. Coleman and A. P. Mason, has established a concrete plant near St. Albans. The company will deal in ready-mixed concrete, sand, gravel and slag. Plant equipment includes six 4 1/2-cu. yd. transit-mixer trucks.

TRI-LAKES CONCRETE CO., newly organized, is opening a ready-mixed concrete plant at Branson, Mo. Officers of the new company are Jack Justus, president; Garrett Wright, vice-president; and Claude Munson, secretary-treasurer. John Stewart and Ben Parnell, along with the officers, compose the board of directors.

WESTERMAN LUMBER CO., Le Center, Minn., has opened a ready-mixed concrete plant at its Montgomery yard. Facilities include an 886-bbl. silo for cement storage and a 125-cu. yd. sand and gravel bin. The plant will serve the company lumber yards in the area as well as supply concrete for local customers.

HANCOCK CONCRETE PRODUCTS CO., Hancock, Minn., has purchased the concrete block and tile plant at Montevideo, Minn., formerly owned by Leonard Rietvold.

SALEM CONCRETE PRODUCTS, Salem, Mo., has been purchased by Harry Mathes and William Kemp, who will operate the plant under the name of Mathes & Kemp Salem Concrete Products.

PLAINVILLE READY-MIX CONCRETE Co. has been established at Plainville, Kan., by John H. Deahl and Raymond Comeau of Plainville and Hays, Kan., respectively. Two transit-mixer trucks are operated, one of 5-cu. yd. capacity and one of 3 cu. yd.

SHOFFNER SAND, INC., Salina, Kan., a sand and gravel firm, has been incorporated by U. C. Shoffner. Capitalization was listed at \$50,000.

ZENITH CONCRETE PRODUCTS CO., Duluth, Minn., recently installed two 128-ft. autoclaves for high-pressure steam-curing of concrete block. Capacity of the autoclaves was said to be 3672 block each.

WARBURTON'S READY MIX CO., Pleasant Grove, Utah, has started production of concrete at its new \$75,000 plant.

CONCRETE SUPPLY CO., Evansville, Ind., has expanded plant operations to include Soffit lightweight concrete block for floor and ceiling construction.

T. A. LOVING & CO., general contracting company, has established a ready-mixed concrete plant at Fayetteville, N. C.



Our present sales staff covers the entire United States (and Canada too). We are pledged to not only provide the industry with **TOP QUALITY PRODUCTS**, but also to render prompt and efficient service.

Check the map for your particular area and salesman. He is equipped and willing to as-

sist you with your problems. If you urgently need his services between calls, wire or phone our Nutley Headquarters "collect"; we will be happy to contact him in the field and have him make a special trip to your plant. The entire Bergen organization is always at your service and through our "CALL COLLECT" policy is as close as your telephone.

*For the Best
in Block Plant
Equipment
it's Bergen!*

BERGEN MACHINE & TOOL CO., INC., NUTLEY, N. J.

You are invited to call us
"COLLECT"...NUTLEY 2-7300



Pouring floor slab for 5,000 homes being built at Thornton, Colorado, by F & S Construction Co., Phoenix, Arizona, for

Hoffman Homes, Inc. Each home requires 42 yds. of 4" slump concrete. Shortness of hauls calls for thorough mixing, fast.

Tested all leading makes... chose Jaegers for 210,000 yd. job

Thornton, Colorado is a new city of 5,000 homes, each requiring 42 yds. of concrete. That's a total of 210,000 cu. yds., not including curbs and gutters. Homes are currently being built at the rate of 8 a day.

To handle this large volume efficiently, Western Concrete, Inc. set up a dry batch plant right on the job site. By doing this, however, hauls became extremely short ... from just across the street from the batch plant to less than a mile ... posing the problem of thorough mixing in transit in limited time.

To do this job, Western Concrete selected Jaeger "Mix Plus" truck mixers. "We have tested all prominent makes of truck mixers and settled on Jaeger," says Fred T. Hoppe, President. Three 6½-yd. Jaegers are used to haul 8 yd. batches. An average production of 50 yds. per hr. is maintained, despite the fact that each 8-yd. load has to be charged through a 1-yd. weigh batcher, requiring approximately 10 min., and that two placements must be made at each location, requiring an additional 8 to 9 min.

Thorough mixing on these short hauls

is accomplished with Jaeger's exclusive "dual mix" drum. The deeper, continuous spiral blades and patented throw-back reversing blades insure positive end-to-end mix, uniformly high strength concrete and fast discharge.

Operation has been so satisfactory that Western Concrete has ordered a fourth "Mix Plus" mixer.

See for yourself how Jaeger truck mixers can put more pay into your payloads. Your Jaeger distributor can give you complete facts, or write for specification TMB-4.

THE JAEGER MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

FRONT END LOADERS • COMPRESSORS • PUMPS • CONCRETE MIXERS • PAVING MACHINES

CONCRETE PRODUCTS, December, 1954
A Section of ROCK PRODUCTS

'LET THERE BE LIGHT'



'Showcase' Bank Illuminates Cold-weather Advantages of 'Incor' Concrete



● Let there be light—and plenty of it—was clearly the objective in designing this beautiful new bank, largest of Manufacturers Trust Company's 111 metropolitan New York branches, recently opened at Fifth Avenue and 43rd Street. The \$3-million building, with its five floors enclosed in huge glass panes, has a wide-open, inviting look, reflecting the fact that banking is a selling service—and this one has the largest showcase in town.

No matter what the design, concrete helps give enduring substance to the designer's creation, and somewhere on every job 'Incor' 24-Hour Cement fits in, to speed concreting and minimize costs. Here, much of the work was done in cold weather, and 'Incor' concrete was used in the 28-ft.-span east-west joist construction with 10-ft. cantilever on Fifth Avenue, in fireproofing, and in the massive vault on the main floor.

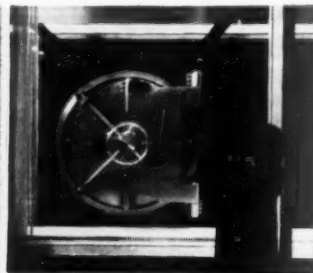
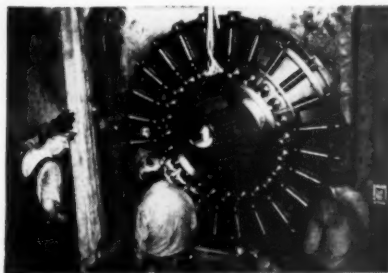
Regardless of building type, an 'Incor'* schedule usually shows the lowest cost, saving up to two-thirds on forms through faster re-use, with the added Winter advantage of eliminating frost risks with only one day's heat-protection instead of the usual 3 to 5 days. It pays to use America's FIRST high early strength Portland cement, for summer speed in winter work... for quality concrete at lowest cost.

*Reg. U. S. Pat. Off.



Placing 'Incor' concrete for New York's handsome 'showcase' bank, recently opened by Manufacturers Trust Company, at Fifth Avenue and 43rd Street, New York City

MANUFACTURERS TRUST COMPANY
Bank Building—Stu. Ave. & 43rd. St.
Architects: **SKIDMORE, OWINGS & MERRILL**
Structural Engineers: **WEISKOPF & PICKWORTH**
General Contractor: **GEO. A. FULLER CO.**
Concrete Contractor:
CHARLES RIZZI CONSTRUCTION CO., INC.
Ready-mix 'Incor' Concrete:
JAMES A. NORTON, INC.
—all of New York City



The new bank's giant Mosler vault, on the main floor, flood-lighted at night, clearly visible to passers-by, contains 304 cu. yd. 'Incor' concrete.

LONE STAR CEMENT CORPORATION



LONE STAR CEMENTS COVER
THE ENTIRE CONSTRUCTION FIELD

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA.
BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON
INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK
NORFOLK • RICHMOND • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 136,000,000 SACKS ANNUAL CAPACITY



Exterior view of new block plant. Curing rooms are in right, foreground

Precision Control In Block Manufacture

• New block plant of Oswalt Co., in Broadview, Ill., incorporates several automatic controls on block machines to assure quality and accuracy in finished product. Weigh batchers and mixers enclosed to control dust dispersion

By HUBERT C. PERSONS

THE NEWEST CONCRETE BLOCK PLANT in the Chicago area, the Broadview plant of the Oswalt Company, was the scene of an open house inspection October 1, following an informal luncheon for 35 guests. The host, George Oswalt, president of the Oswalt Company, unveiled a number of innovations in block making at the new plant located on the Belt Railway line in Broadview, a southwestern suburb of Chicago.

Among the unusual features of the Oswalt plant are weigh batchers and mixers completely enclosed for dust control, skip charging of block machines, automatic control of steam in curing rooms, cement handling by pump and Airlide, height and density control, moisture meters, turntables, front end block ejector and pallet feeder, and several changes in the conventional type block machine.

Handling of Raw Materials

Bulk cement from three different suppliers is delivered to the plant in railroad cars. An Airlide takes the cement to a Fuller-Kinyon pump which carries it either to a 400-bbl. elevated feeder bin or to a 600-bbl. reserve storage bin. The feeder bin supplies cement to one mixer by gravity and to another by screw conveyor.

Three types of aggregate are used: cinders; water-cooled expanded slag under the trade names of Celocrete and Garylite; and sand and stone chips, the latter used in special units known as "Tintblox."

Cinders, delivered by truck, are stockpiled in the yards for weather-curing. When required, the cinders are moved by a Hough Payloader to the boot of a Webster bucket elevator which conveys them to one of the large compartment bins in which both cement and aggregates may be stored.

Before use the cinders are run over a $\frac{3}{8}$ -in. screen and magnetic roll to remove any tramp iron. A magnetic separator and limewater bath will shortly be installed to treat the cinders for the elimination of any chemical elements which might cause staining in concrete block.

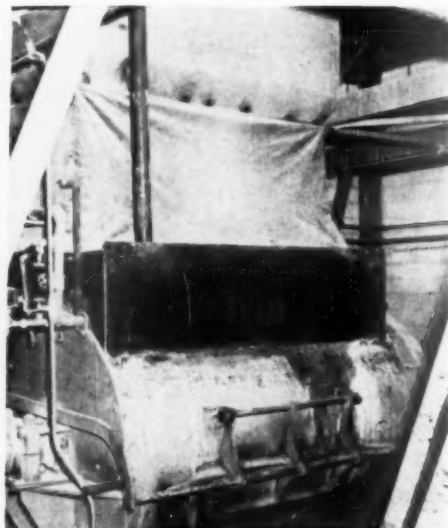
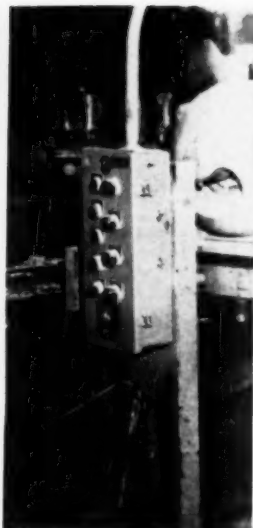
Two block machines are being operated. These are similar to a conventional type of high production block machine but are assembled with a number of special parts and devices designed and built by the Oswalt organization to increase productive capacity. These devices include the "Oswalt Height and Density Control" which Mr. Oswalt says also incorporates apparatus for regulating the vibrating motors in the block machine.

"Our height and density control," Mr. Oswalt explains, "is operated by an Allen-Bradley control panel which is designed to stop the block machine as the feed drawer is over the mold, and to remain stopped until the clock in the timing device returns to zero. If no extra time is needed for extra fill, then the time clock is set at zero and the machine is not caused to stop at this point. The feed drawer then is returned after ample feeding and the forming head comes down upon the mix and the vibration continues until the height stops, mounted on the adjusting screw, come down to the bronze height cap.

"If an excessive amount of material is in the mold," Mr. Oswalt explained further, "the machine is stopped until the vibration brings this block to size. When pins meet, the machine is automatically started in operation and the blocks so produced are uniform in height.

Colored Lights Are Guide

"If extra material has been fed, a blue light shines to show time was lost in bringing the block to size and the clock will be set for less time. If sufficient material is fed and the height stop pins meet too soon, a red light shows informing the operator that in-



Left: Front end of block machine, showing block ejector and pallet feeder. Center: Height and density control on each block machine. Right: One of the mixers covered for dust control

sufficient material was fed into the mold and that the block, although it may look perfectly good, will be unnecessarily porous and would not meet strength requirements.

"The plant superintendent or machine operator, by visual observation of the four lights in the control panel, can know exactly what is going on within his mold without guesswork and have a positive assurance that he is making block of good quality."

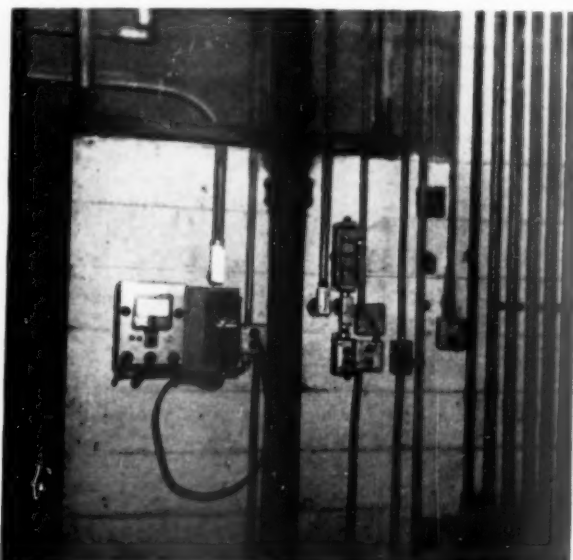
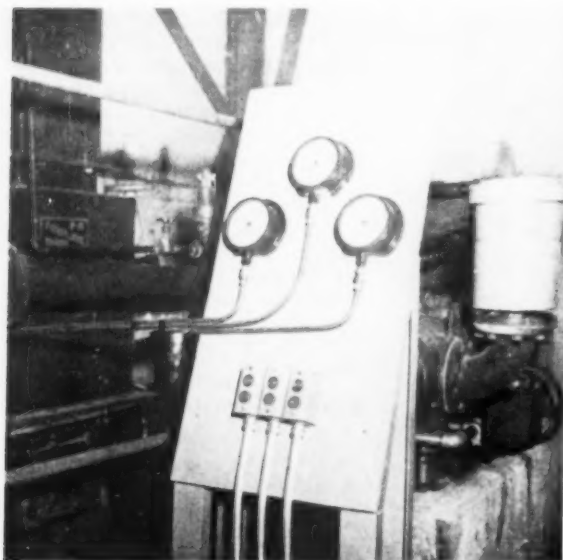
Another feature is the block ejector and front-end pallet feeder. This equipment eliminates the necessity of taking racks around the back and then bringing the racks forward to the front of the machine, saving the services of the man putting the pallets in at the rear. The block is said to be ejected

without shock because of the harmonic crank system employed in ejecting the block. The crank action taking the block out of the machine starts in an upward motion and is timed exactly with the operation of the machine; in one-fourth the time required to eject the block, the crank turns only one-seventh of the horizontal distance and picks up speed until the crank comes to the top of this stroke. At that time, the action is decelerated until the crank is turning in a downward motion at the end of a stroke. As the crank moves nearest to a vertical direction, the framework carrying the block from the machine is lowered, leaving the block on a stationary rail without rubber belts, rollers or chains to deliver the block any farther. As

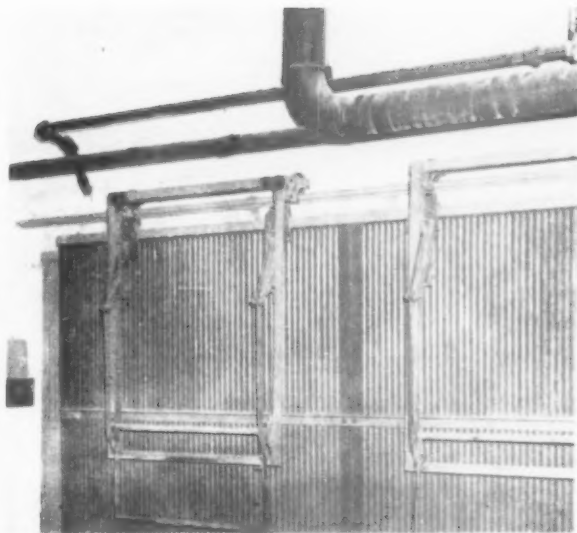
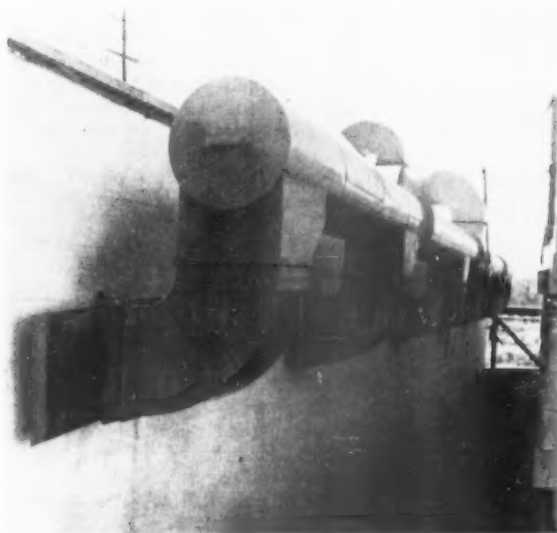
the block is taken from the machine, a pallet is simultaneously placed on the rubber of the pallet lifting frame from the front. Block are removed from the ejector, two pallets at a time, and racks are filled from the top down.

Moisture Meters on Each Mixer

Each block machine is served by a 50-cu. ft. Besser mixer equipped with P & S moisture meters. There are also separate weigh batchers for each mixer. The moisture meter regulates the water in each batch of concrete according to the moisture content of the aggregate. The moisture meter dial is set so that it automatically cuts off the water when the moisture content of the mixed material is correct for the best quality of concrete. It also con-



Left: Controls in cement handling room. Right: Water meter for mixer



Left: Steam exhaust duct work from curing rooms. Right: Kiln door showing kiln controls

controls mixing time and flashes a signal light after 4 min. of mixing. Because this device is push-button operated and fully automatic, there is no necessity for opening the mixer to observe the water content. This makes it practical to enclose both mixers and weigh batchers in a dust-proof cover.

The mixers discharge into skip hoists installed in a pit 8 ft. below the floor level of the plant. These skips charge the block machines. Locating the skip hoists below the plant floor level reduces the height of the main plant building by 18 ft.

All the men serving the block machines and handling block in and out of the curing rooms work at the same floor level. A turntable installed near one of the block machines enables the operator to control the position of the racks at all times with relation to the pallet offbearer and facilitate the movement to the block curing rooms. Two men do all the cubing.

Operate Six Curing Rooms

There are six curing rooms, four of which are equipped to handle 40 racks and two to contain 38 racks. There is space for two additional curing rooms, 12 ft. 8 in. by 65 ft.

A 300-hp. boiler operated at 5 p.s.i. pressure provides wet steam at 180 deg. F. The steaming cycle is at night, starting after the block machines are shut down. An 8-in. header across the entire steaming area insures steam of equal temperature and density in all parts of the curing rooms.

Curing room temperature is maintained at 180 deg. F. by a Terrice temperature regulator installed in the steam supply lines to each curing room. A time control instrument turns the steam on at a predetermined time and shuts it off at the end of the steam-

ing period. This timing device consists of a time clock connected with a solenoid control steam valve that is energized when the clock is on and is closed when the time cycle is completed.

The 20-acre tract of land on which the plant is located, was formerly a flower nursery. This affords ample room for covered storage facilities which Mr. Oswalt says are to be built soon.

Operations at the new block plant began in March, 1954. Present daily capacity is 15,000 8 x 8 x 16-in. equivalents for a single 8-hr. shift. The block are marketed under the trade name "Oswalite." The new plant replaces a smaller block plant which was started by the Oswalt Co. in Forest Park, Ill., in 1936. This plant was modernized in 1946 and had a daily capacity of 7200 block. It was discontinued after the new Broadview plant got into full operation.

Principal officers of the Oswalt Co. are George Oswalt, president and R. A. Probert, treasurer. George Oswalt is also head of the Oswalt Engineering Service Corporation with offices in Forest Park, Ill. This organization offers an engineering service to block plant operators to increase production.

Precast Incinerator

U. S. GRILL & INCINERATOR CO., Battle Creek, Mich., has started production of a precast concrete incinerator which also doubles as a picnic grill, and is produced in four colors. Leslie Mills, inventor of the new unit and head of the firm, stated that the initial trial production was to be increased considerably as orders for the combination unit are running well ahead of production.

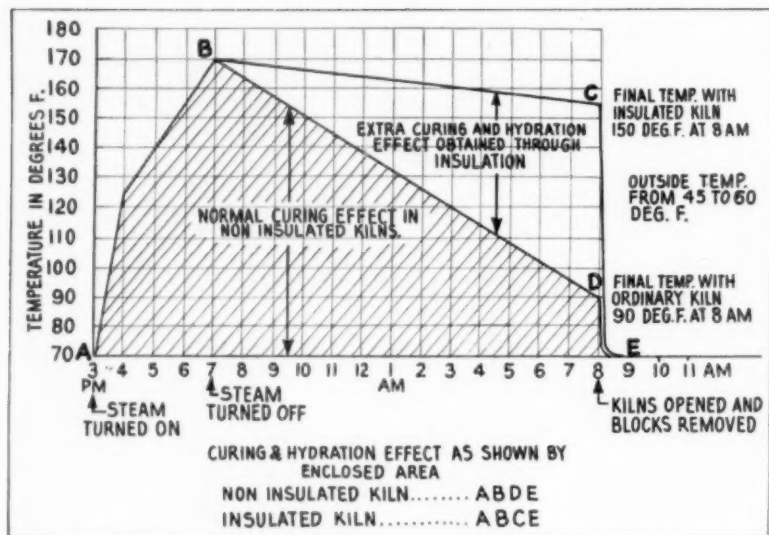
First Precast Concrete Panel Swimming Pool

THE MARIETTA CONCRETE CORP., Marietta, Ohio, recently completed construction of what was said to be the first successfully built precast concrete panel swimming pool. Total cost of this 20- x 40-ft. pool, which was installed at a private estate in Williamstown, W. Va., was \$4500, including filtration equipment, diving boards and walkways.

The pool was assembled in six prefabricated wall sections, while the pool floor was cast in place at the site. Recesses were left around the edges of the floor to permit the sidewalls and end sections to fit snugly. Two L-type concrete brackets were bolted into position at the center of the long sides of the pool and, from this skeleton, the remainder of the pool took form.

Each end piece of the pool was precast in a solid section 5 in. thick, measuring 5- x 20-ft. These 7000-lb. sections were transported to the pool site by truck and lowered into position by a mobile crane. Tongue-and-groove joints were features of the design and all sections were provided with metal eyelets so that bolts could draw the sections together when assembled in place. Rubber hose material was also used to insulate the joints and insure water-tightness. Installation of the pool walls was said to have required only 9 hr., of which 3 hr. were spent in erecting and bolting the six panels and two brackets in place, and 6 hr. for lining up the sections, grouting and caulking.

Assisting in the planning and designing of the pool were Neil Christy, vice-president in charge of engineering for Marietta, and Richard Adams, architectural engineer.



Graphic presentation of additional block curing effect through the use of well designed and insulated kilns. Steam demand and consumption for a well-insulated kiln is only 60 percent that of the non-insulated kiln

How to Build Well-Insulated Block Curing Kilns

By WILLIAM J. SHORE*

IT IS POSSIBLE TO ELIMINATE practically all of the common block curing difficulties through the proper construction and insulation of steam curing kilns.

Among the troubles encountered in curing block, these are most common and prevalent:

- Insufficient degree of heat rise achieved.
- Excessive length of time before heat rises to proper degree.
- Loss of heat in kilns during cold weather season, and reduction in loss of curing capacity.
- Kiln floors flooded with condensation from steam supplied by pipe lines.
- Block fail to dry and lighten in color when removed from kilns.
- Block do not have sufficient strength to permit raising cubes with fork lift; excessive breakage.

The above experiences are due to:

- Inadequate steam generator capacity, or —
- Kiln structure excessive in weight mass, poorly insulated, or —
- A combination of both (a) and (b).

Kilns that are properly built of lightest weight masonry and well in-

ulated on all sides, require only 50 to 60 percent of the steam that the ordinary types of kilns demand.

The writer's observations and tests carried on over a period of years indicate definitely that when kilns are properly built; that is, light in weight and well insulated, consumption of fuel is so small that it becomes a negligible item of expense.

(Such kilns should turn out good quality cured block with a fuel consumption of 7 gal. of fuel per 1000 standard 8-in. units.)

Kiln Construction—Insulation

The following recommendations indicate how to build kilns that use minimum steam and cut heat loss.

DOORS: There are available a series of doors of steel and aluminum construction, with insulation, and with carrier arrangements that provide tight closures and cut down heat loss.

Where initial cost is a factor, light sturdy wood frames may be built, with insulation, and covered with sheet aluminum that also serve a good purpose; prevent heat loss and escape of steam.

Improvement in block curing and reduction of steam demand usually follow the installation of good door closures.

FLOORS: Floor slabs should be of at least 5-in. thickness and in sections, and set in between kiln side walls. Each kiln floor should be separate. A common floor slab for all kilns is undesirable, and is a potential loss of heat through conduction.

Before floor slabs are poured, there should be an excavation of about 6 in. which should be filled with insulation. This may be a mixture of mill shavings and sawdust, and for highest class service should be loose rock wool tamped down.

The use of cinders underneath floor slabs is useless. The type of cinders available to block plants have no insulating value, and the cinders would be put to better use in the form of block.

SIDE WALLS: Side walls may be of block, 8 in. for the outer walls and 6 in. for the partition walls. The use of sand-stone-cement block are not recommended, mainly because these have too much weight and absorb too much steam. Block for side walls should be of the very lightest weight combination that is possible, even at a sacrifice of strength qualities. (After all, the weight carried is negligible). The lighter the block are, the better efficiency will result.

Each air space in the block should be filled with rock wool in loose form, packed hand tight. It is a common notion that air spaces in blocks constitute insulation, but practical observation indicates that this is not so. The heated air begins moving and transmits heat from the inner block wall to the outer block wall, and then heat is dissipated to the outside.

The author has confirmed this in many instances. Where the first few rows have been filled with insulation, there is no sign of heat, and when touching unfilled rows one notices at once that these are warm and hot.

During windy days, this heat loss is aggravated by the action of the cold air striking the kiln walls and wiping the heat away so rapidly that often it becomes impossible to raise temperatures in such kilns to the proper degree.

KILN ROOFS: The greatest source of trouble in heating kilns comes from kiln roofs. Many of these cases are created unknowingly by block manufacturers who design kilns without regard for heat absorption and heat loss. Kilns vary in width from 8 ft. to 18 ft. On kilns that are 12 ft. or more in width, the roof span requires substantial construction, merely to hold its own weight. A roof thickness of 6 in. of concrete is not at all uncommon, and in many cases, roofs are 8 in. thick. They are costly to install and build, but that is only a minor disadvantage.

*Engineering Consultant, Shore Engineering, New York, N. Y.

A heavy roof demands a great deal of steam before it becomes heated. Whatever heat goes into the roof structure is taken away from the block. Where a roof is 6 in. in thickness it has a weight of about 60 lb. per sq. ft. The steam that goes into heating the roof of 60 lb. per sq. ft. is equivalent to the heat that goes into two 30-lb. cinder block. If a kiln has a roof of 500 sq. ft. and is 6 in. thick, it requires as much steam to bring the roof up to heat as it does to heat 1000 standard 8-in. cinder block.

This point is rarely appreciated by block manufacturers when they build heavy roofs. All that is done is to increase the amount of steam put into the kiln, and later this steam is found in the form of water on the floors when the kilns are opened to remove block.

Further, these heavy concrete kiln roofs have no insulating values, and heat escapes rapidly because the roofs are exposed to the surrounding air and winds and there is nothing to stop this loss of heat.

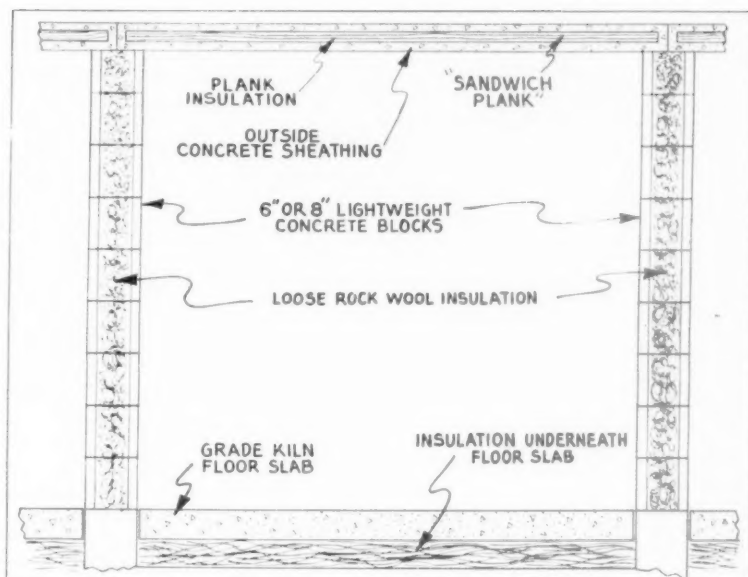
The writer knows of one instance where the kiln roofs were of 8-in. concrete, and a 30-hp. steam generator was installed to provide steam for curing block. After 4 hr. operation, there was hardly any increase in the kiln temperature. This difficulty, caused entirely by the overwhelming mass of roof concrete, proved how wasteful such construction was.

To avoid the need for heavy concrete roofs, it is recommended that kilns be made of narrower width, say 8 ft., which is sufficient to allow racks, in two rows side by side, or one rack crosswise as when delivered by fork-lift trucks.

Such kilns are better than the wider kilns and they allow lighter roof construction in the form of reinforced concrete planks.

But the lighter and thinner concrete planks have no insulating value and heat would stream right through them. To overcome this, insulation has been added on the inside of the kiln roofs. Experience shows, however, that insulation has a short life when exposed to the hot steam and acid laden vapors that are so common in cinder block kilns.

To procure a combination that included the strength of concrete, and the insulating qualities of a non conductor, there was developed in collaboration with the Porete Mfg. Co. of North Arlington, N. J., what is called, "a Sandwich Plank," designed especially to have strength in the form of concrete plank with reinforcement, and insulation in the form of a filler of insulating material surrounded entirely by concrete, so that it could not



Cross section of concrete block steam curing room showing method of insulation for maximum efficiency at low cost

be affected by acid and heat-laden surrounding moisture. This plank comes in widths of 24 in., is 4 in. thick, and long enough to cover spans of 8 ft. 6 in. This material has a *K* factor of .19.

This type of plank exposes only a thickness of 1.75 in. of concrete thickness to the kiln. The concrete is of a lightweight aggregate and weighs little. Each square foot underside weighs about 15 lb., and therefore will only take steam equivalent to one-half of a 30-lb. cinder block. Thus, as compared with a 6-in. concrete roof, it would demand a steam consumption of only one fourth the quantity, a saving of about 75 percent in steam demand.

A kiln roof composed of these planks is easily assembled. A forklift truck puts them in place, and for a kiln about 60 ft. long, 30 planks are required.

To protect the roof from leaks and erosion due to cold weather and frost, two layers of roofing felt are nailed in place and the succeeding three layers are then laid down in roofing pitch.

Approximate cost per square foot of plank is about 65 cents per square foot which compares favorably with other types of roof structures.

General Remarks

All block manufacturers generally erect kilns with masonry units out of their own production.

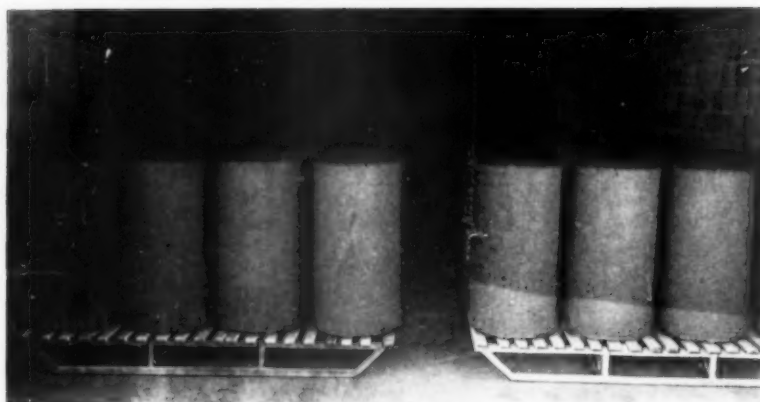
Their point of view is that they are erecting a structure of masonry which should incorporate ruggedness, rigidity and strength. If this structure had

as its purpose and use such qualities as are commonly demanded in the building art, it might be said that the general design and execution were noteworthy.

As it happens, however, the structure and enclosure is to be used solely as a means for storing block for a short period and subjecting these block to huge quantities of steam, so that the block heat up slowly and steadily to a proper degree of temperature to promote and accelerate the more rapid and complete hydration of cement, and thus in a few hours produce a strength that might normally be achieved in open air in a matter of 10 to 14 days.

Therefore, the structure should be as light as possible so that most of the heat thrown in will go into the block instead of the walls, the floor and the roof. Then the structure should be built of such materials that have such poor heat conductance, that only a little of the heat within could escape to the outside.

Thus, while this structure would be nowhere near as strong as those now being built, a kiln of this design would prove far more useful to block manufacturers. For a given quantity of steam, there would be more complete hydration, more rapid evaporation of water from block when removed from kilns, a higher early strength and a far more attractive block coloring. Put in another way, for an equal degree of curing, fuel consumption would decrease by approximately 40 percent. Either of the alternatives are useful and important to block manufacturers.



Elevated pallet provides circulation in curing room

• American Concrete Pipe Association Short Course School of Instruction program included such important subjects as curing, design of concrete mixes, durability of concrete in acid soils, hydraulics of culverts, calcium chloride research, and panel discussions

By HUBERT C. PERSONS

Pipe School Attracts Big Attendance

THE AMERICAN CONCRETE PIPE ASSOCIATION's fourth annual Short Course School of Instruction held at the Statler Hotel in St. Louis, Mo., Oct. 25 through Oct. 27, passed all previous attendance records with 150 registered.

Technical papers by outstanding specialists in the manufacture and installation of concrete pipe lines and the making of quality concrete, featured the first two days of the school. On Tuesday, October 26, following the regularly scheduled program, a night session was held at which many told of actual experiences with special problems concerning machine made pipe.

Panel discussions of various manufacturing problems made up both morning and afternoon sessions on the third and final day. Fifty different questions suggested by members of the Association were the basis of the discussions.

The first session was opened by A. W. G. Clark, president of the B. C. Concrete Pipe Co., Ltd., Vancouver, B. C. He said the record-breaking attendance should be regarded as a tribute to the efficient work of the Association staff.

"Pipe men have a moral responsibility to see that their product is used properly," Mr. Clark declared. "We must each police, as far as possible, installations in our territories." He called attention to the fact that in many places higher than usual fills which calls for pipe of unquestioned strength. He declared that the hydraulic superiority of concrete pipe is being recognized by many government agencies. He said that research is finding answers to some concrete pipe problems and referred especially to

the research on hydrogen sulphide being conducted at Tulane University under the sponsorship of the Association. In closing, Mr. Clark called attention to the fact that the American Concrete Pipe Association will be 50 years old in 1958.

The City of St. Louis has used concrete pipe since the 1860's, E. E. Bloss, consulting engineer with the St. Louis firm of Horner & Shrifrin, told the visitors in a welcoming address. Before the year 1900 more than 40,000 lin. ft. of concrete pipe was in service in St. Louis, Mr. Bloss said. Two sections of 15-in. concrete pipe installed nearly a century ago were dug up recently in excavating for a housing project. By way of contrast he said that 108-in. and 120-in. pipe was used in a recent St. Louis sewer project.

How to Get Desired Finish

The importance of using the correct amount of cement in a concrete mix was emphasized by J. Harry McDonald, of Atlanta, Ga., field engineer of the Penn-Dixie Cement Corp. He spoke on "Design of Non-Plastic Concrete Mixes."

"You get the desired finish if you have a properly proportioned mix," Mr. McDonald said. He used a blackboard to tabulate "Maximum Permissible Value of Fineness Modulus of Aggregates," based on early work of Duff A. Abrams in the Structural Materials Research Laboratory of the Portland Cement Association. He also gave equations for the design of both no-slump and slump mixtures by the fineness modulus method.

Important Role of Curing

An outstandingly practical paper on "Curing of Concrete and Other Factors in Making Good Concrete Pipe,"

was delivered by Lewis H. Tuthill, concrete engineer of the U. S. Bureau of Reclamation, Denver, Colo. Mr. Tuthill threw on the screen 35 graphs, charts and photographs to illustrate his talk. He began by asking and answering the question, "Why is Curing Important?" He referred to the talk at the 1953 short course school of the A.C.P.A., by Hubert Woods, director of research, Portland Cement Association, who he said, "explained to you the intricate details of cement hydration in concrete."

Continuing, Mr. Tuthill said "Mainly this was the formation of gel as the reaction between cement grains and water continues. Unless water remains present, the development of gel cannot continue. On its continuance, to a certain degree depends strength and quality of concrete to be expected from the amount of cement used. Thus the important role of curing emerges. Mr. Woods stated that even in an atmosphere of 80 per cent relative humidity, the rate of hydration continues to fall as the paste dries out and the hydration virtually ceases.

"With these basic necessities in mind, we can better appreciate why it is necessary, if we want best results, to adopt plant and field practices which insure the presence of moisture in the concrete sufficient to hydrate its cement as required to provide the quality of concrete desired."

Mr. Tuthill showed a graph illustrating that compressive strengths of moist cured concrete from 3 to 28 days old was far above that of concrete without moist curing.

Other slides showed 18-in. irrigation pipe in moist room on elevated pallets and in the open air being water sprinkled inside and out. Mr. Tuthill emphasized the fact that the ir-

rigation pipe shown in his pictures was unreinforced and therefore must rely entirely on concrete strength. "Usually ample cement and a good mix is used," he said, "but sometimes curing is inadequate to fully mature and develop potential quality of the mix in hardened concrete. There are margins of quality above that sufficient to pass hydrostatic and bearing tests that are worth having and are available for only a few days of thorough water curing.

"Such strength is best developed," he said, "by thorough water curing: (a) inside and outside; (b) free from drafts first 12 hours; (c) continually wet with moisture on surfaces for 7 days; and (d) beginning not earlier than 3 hr. after casting. pipe may be warmed with steam for not more than 16 hr. at a temperature not exceeding 140 deg. F.

Mr. Tuthill said that moist curing is especially beneficial for brushcoat or Guniting on bells and specials, and showed with a slide picture how poorly cured brushcoat or Guniting can be cut with a nail.

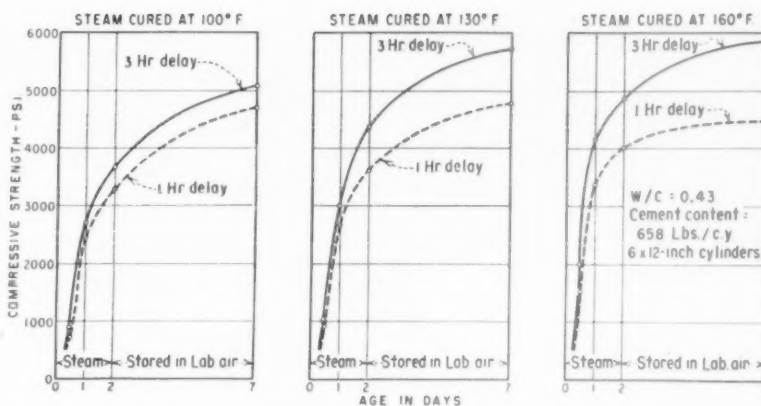
"Low pressure steam curing is an industry expedient generally accepted for sake of economy," Mr. Tuthill said. "It is really only high temperature curing; too often not moist, high temperature curing. High temperatures, especially when applied too soon, appreciably reduce ultimate strength of concrete. Thus best practice requires that: (a) steam curing not commence until 3 hr. after concrete is placed; (b) its maximum temperature not exceed 150 deg. F.; (c) inside and outside surface of pipe reach the same temperature; and (d) concrete surfaces be made wet and be kept wet during steam curing.

Mr. Tuthill showed five slides demonstrating the benefit of a 3-hr. delay and limitation of temperature.

Four slides of factors affecting the strength of concrete were shown. These, Mr. Tuthill said were amount of cement per cubic yard, water-cement ratio, degree of curing, type and brand of cement and air-entrainment.

Mr. Tuthill listed some of the principal factors increasing the early strength of concrete as an accelerator (usually calcium chloride), high temperature of concrete as mixed and during early curing, high early type of cement and additional cement in mix. He also listed some of the factors increasing ultimate strength; as low temperature concrete as mixed and placed (40-50 deg. F.), slower hardening types of cement, (II, IV, V), some retarding and some wetting admixtures, many pozzolans as an admixture, more cement in mix and prolonged favorable curing conditions.

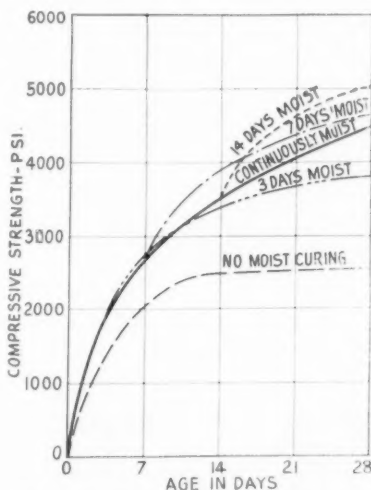
Sulfate corrosion of concrete can



Curves showing effect of delay period and temperature on strength of steam cured concrete specimens

be serious, Mr. Tuthill said. "Sulfate salts in ground water, attack aluminate compounds in the cement in concrete," he explained. "Cement low in aluminate compounds is more sulfate resistant. In corrosive areas pipe made with Type I high aluminate cement may be completely corroded and decayed in only a few years. Whether the cement is high or low itself in alkali (Na_2O or K_2O) has nothing to do with its resistance to sulfates in ground-water. Mr. Tuthill showed four slides demonstrating dramatically the effect of sulfates on drainage structures, pipe and floors on ground.

Concrete pipe which will be comparatively sulfate resistant can be made, he said, by obtaining good workmanship and quality of concrete, using cement low in aluminates and high in silicates (preferably having less than 4 per cent C_3A , a true Type V sulfate resisting cement), by use of additional cement instead of any admixtures or coatings and by drying pipe 30 days after thoroughly curing.



Moist curing appreciably increases concrete strength

Minor repairs on bell and spigot gasket bearing areas should be as reliable as other parts of the pipe, Mr. Tuthill declared. Such repairs, he said, should require a minimum of curing and protection from freezing. He listed these basic rules to be followed in making minor repairs: bonding surfaces must be clean and damp; repair material must be rubbed into these surfaces just before the hole is filled; prompt curing treatment is necessary and it is best to use a sealing cover of Scotch tape; and mineral lead or leadite can be used to make sound fillings of small holes provided they are well cleaned first and the filling is sanded smooth.

Concrete in Acid Soils

Prof. Dalton G. Miller, whose announced subject to close the first day session was, "Durability of Concrete in Aggressive Soils," narrowed the discussion to, "Resistance of Concrete in Acid Soils." Prof. Miller is research associate, Department of Agricultural Engineering, University of Minnesota.

Prof. Miller described in some detail, research work on small diameter drain tile at the University of Minnesota Laboratory. This work, he said, involved examinations and tests of some 1100 commercial and experimental drain tile and 10,000 experimental cylinders 4-in. long and 2-in. in diameter. The experimental specimens were installed in peat soil in Minnesota and Wisconsin and in acid mineral soil in North Carolina.

Drain tile may fail in service, Prof. Miller said, from overloading, frost action, disintegration due to soil alkalies, such as magnesium or sodium sulfate and from chemical action of soils which are definitely acid.

"The loads to which tile will be subjected after they are installed," Prof. Miller said, "will depend chiefly on depth of the trench, width of the trench, nature of bedding provided for

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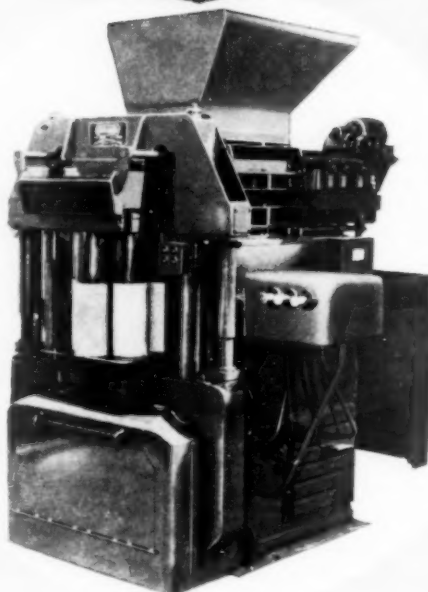
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the tile, and type of soil and subsoil. By proper evaluation of these factors, the load on the tile may be calculated previous to installation, and thus failures from overloading need not occur in a properly designed tile system. Furthermore, most tile of the smaller diameters which meet the requirements of Specification C4-50T of the American Society for Testing Materials will withstand the load imposed if the trenches are not unusually deep or wide."

As to frost action, Prof. Miller pointed out that the dry and rich mixes ordinarily used in making drain tile, produce a concrete highly resistant to freezing and thawing. "Therefore," he said, "concrete tile which meet the A.S.T.M. specifications rarely, if ever, fail from frost action."

Prof. Miller emphasized the importance of especially strong concrete in acid soils. "Chemically, any portland cement is a base," he said, "and certain constituents of the cement in drain tile will react with the acids present in some soils. The extent of the action will depend principally on the degree of soil acidity and the permeability of the tile walls. Any concrete tile installed in definitely acid soils should be extra-quality or better."

"A definitely acid soil," Prof. Miller said, "may be considered to be one with a value that approaches 6.0 on the pH scale commonly used and generally found to be satisfactory to express the effective acidity of a soil. When this value drops much below 6.0, a soil is usually considered to be markedly acid."

"The proportion of the corn belt area which has subsoils with a pH not far above 6.0 is by no means insignificant. From the standpoint of long-time service, this is ample reason for installing only well-made concrete tile in all drainage systems."

"Tile of the smaller diameters that will consistently meet A.S.T.M. requirements can be made on the 'packerhead' machines in common use if certain manufacturing provisions are established and maintained. These are: (1) well-graded sand aggregates and sufficient cement, (2) maximum of mixing water, (3) ample compaction of materials, and (4) adequate curing."

"For all purposes the essentials of good grading for drain tile of the smaller diameters may be expressed briefly in this way: not much less than 40 per cent retained on the No. 8 sieve, with preferably somewhat more than half of this 40 per cent retained on the No. 4 sieve. Without a high proportion of these coarser particles in the mix it will be extremely difficult to produce drain tile which will be low enough in absorption to meet the requirements of A.S.T.M. C4-50T."

Prof. Miller showed a tabulation of the effects on absorption of variation in the grading of aggregates.

Hydraulics of Culverts

R. E. Schiller, Jr., assistant professor of hydraulics at the Agricultural and Mechanical College of Texas, opened the second day program with a technical paper on "The Hydraulics of Culverts."

"The initial prerequisite to the design of any culverts," Prof. Schiller said, "is a knowledge of the hydrology of the culvert site. The flow characteristics in a culvert are determined by the design variables which are: roughness, diameter and shape, length and slope of the culvert, inlet and outlet geometry, and the headwater and tailwater elevations. A convenient hydraulic classification of culverts is based on the location of the culvert control, which is in turn, determined by the relative magnitude of the design variables. The nature of a control section is such that flow conditions downstream of the section do not affect the flow upstream from the section. The control may be at the inlet or at the outlet."

"When the inlet of a culvert controls the flow, the head-discharge relationship is independent of the variables of the barrel or outlet and is dependent only on the inlet geometry. Generally, if the culvert is short the control is at the inlet whether the culvert flows full or part full, providing the outlet is unsubmerged."

Culvert Surveys Important

Clyde E. Haager, chief engineer, Ohio Concrete Pipe Manufacturers' Association, followed Prof. Schiller with a talk, "Culvert Condition Surveys." He declared that because of the many toll road and freeway programs in many states, culvert pipe is of primary importance. A culvert survey, he said, "is an excellent way of showing just exactly what is occurring in the highway drainage system and how wisely the highway revenues are being expended."

"In addition to becoming more familiar with the conditions of the culverts in your several states, a survey might show the need for a better manufacturing process or for an improvement in the installation methods. In short, for the benefit of the concrete pipe industry, certain design and specification changes may become apparent and desirable."

After Mr. Hagar's talk a motion picture showing the use of Tylox rubber gaskets as a coupling medium in concrete pipe lines, was shown by Roy Hein of the Hamilton Kent Manufacturing Co.

The Tuesday afternoon session was

opened by Col. R. R. Litehiser, engineer of tests, Ohio State Highway Department. He spoke on "Specifications for Core Testing Large Diameter Concrete Pipe." Some of the pipe testing done in the highway department's testing laboratory in Columbus, Ohio, was illustrated with slides.

Col. Litehiser told of using the same concrete mix and reinforcing as is used in concrete pipe, to cast test block and test cylinders. Half of these, he said, are steam cured for 24 hr. and then air dried. Tests are made after specimens are 28 days old. The speaker described two different types of machines for cutting cores and also showed a device used for capping cores for testing.

Problems in Sewer Work

Proper inspection and enforcement of specifications are major problems in sewer work, E. F. "Gene" Bepalaw, of Memphis, told the pipe men in an "off-the-cuff" talk at the Tuesday session. Mr. Bepalaw is vice-president of Choctaw, Inc. and is chairman of the A.C.P.A. Technical Problems Committee. He discussed "Problems in Properly Bedding Concrete Pipe Sewers and Culverts."

"See that pipe is properly bedded and backfilled and you save a lot of trouble," he said. "Our salesmen must visit every job they sell."

Mr. Bepalaw suggested that concrete pipe manufacturers should try to get various state highway departments to hold schools for inspectors on drainage structures. "It is up to us to be teachers," he said.

"Recent increases in population in many areas have overloaded sewer lines and some are failing," Mr. Bepalaw said. He emphasized the fact that small diameter pipe should not be laid too deep. He also warned against laying pipe in "soupy" material. Replace some of the poor material in the trench with granular fill," he suggested.

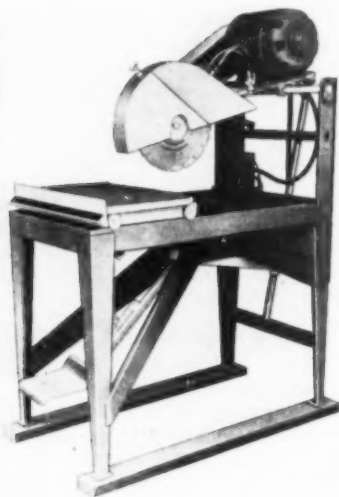
The speaker emphasized the importance of backfilling. "Backfill should be placed in 4 to 6-in. lifts and should be tamped up to the top of the fill," he said. He urged the use of pneumatic tampers.

"Improperly made joints are a cause of trouble," Mr. Bepalaw said. "Unless joints are made right they cannot last." One cause of trouble in pipe lines, Mr. Bepalaw said, is careless use of heavy bulldozers or similar heavy equipment in backfilling. "You must backfill under the haunch of the pipe to be safe."

At the end of his talk Mr. Bepalaw called to the platform, Eugene Thomas of the Faulkner Concrete Pipe Co., Hattiesburg, Miss., to tell of the fail-

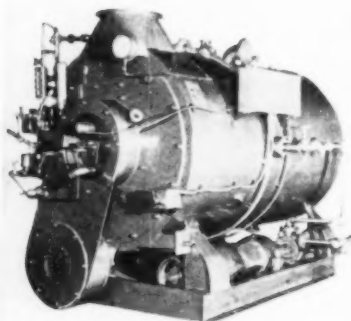
(Continued on page 162)

NEW MACHINERY



Masonry Saws

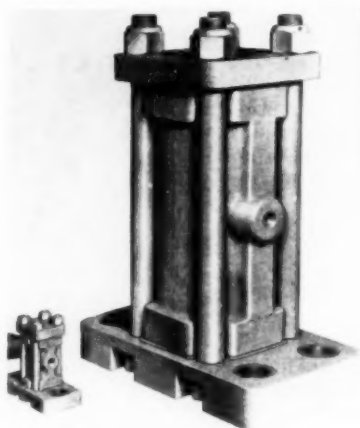
FELKER MANUFACTURING CO., Torrance, Calif., has announced the Di-Met masonry saw for both wet and dry cutting, and for angle, skew, step and through cutting operations. The head is removable for portability, and is equipped with a 1½-hp. single phase motor. Arbor height adjustments are made by tilting the foot pedal, lifting the counterbalanced arbor and releasing the pedal. An independent electric circulating pump supplies coolant from the tray to both blade sides, when required. Conventional abrasive wheels or diamond abrasive blades may be used.



Steam Generator

UNITED STATES RADIATOR CORP., Cyclotherm Div., Oswego, N. Y., has developed a 250-hp. firetube steam generator, 9 ft. 5 in. long, which is said to be the smallest of its type. The unit, Model MC-250, burns either oil or gas, or oil and gas, and for marine installations, it can be adapted to burn

the same diesel fuel that powers the ship. It is designed for 15 to 200 p.s.i. pressure, delivering a maximum of 7500 lb. of steam per hr. with a normal operating capacity of 6250 lb. per hr. The boiler is equipped with a modulating unit that operates from 30 to 100 percent of capacity. The generator utilizes the patented Cyclonic Combustion principle coupled with a two-pass design. A revolving spiral vortex of flame in the combustion chamber travels at a rate of approximately 290 f.p.s. The fuel is consumed in the combustion chamber.



Bin Vibrators

THE CLEVELAND VIBRATOR CO., 2828 Clinton Ave., West, Cleveland 13, Ohio, has developed the 1- and 5-in. diameter Type F vibrators. The 1-in. vibrator is a lightweight unit, and the 5-in. model is a heavy-duty long stroke unit for larger bin applications and extreme arching, bridging and sticking conditions. Both vibrators operate on 25 to 100 p.s.i.g. continuous line pressure, and are designed for continuous or intermittent operation.



Truck Mixer

CONCRETE TRANSPORT MIXER CO., 4985 Fyler Ave., St. Louis 9, Mo., has announced the addition of the Model

35 Rocket 3½-cu. yd. truck mixer to its line. The unit features hydraulically-operated chute control, with permanently attached "flip-flop" chute and a heavy-gauge, lightweight aluminum detachable extension chute. Other features include: Timken-Detroit reduction unit; chain drive; standard electrically-operated revolution counter; and a choice of available industrial engines.



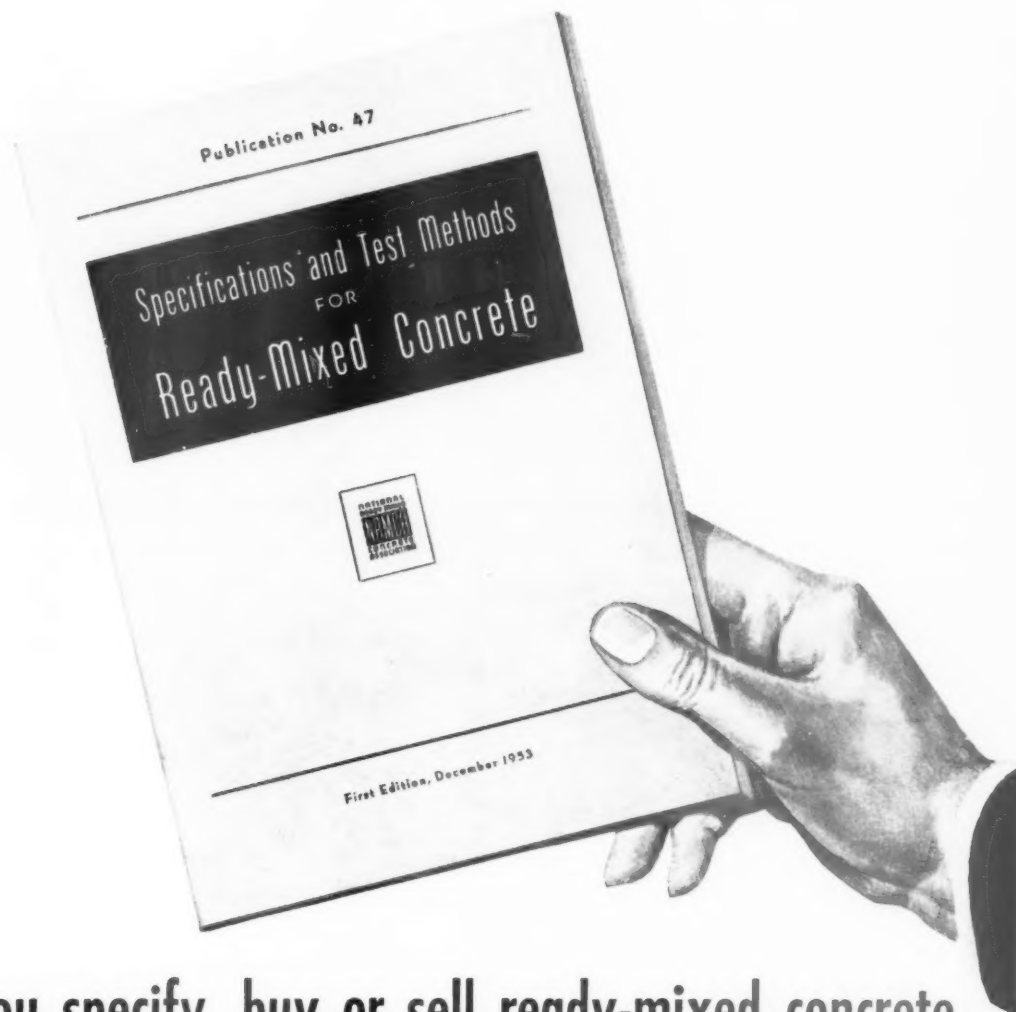
Septic Tank Molds

THE NORWALK VAULT CO., Norwalk, Ohio, has announced molds for approved, rectangular, concrete septic tanks. The equipment is of all-steel construction with a one-piece inside core to facilitate stripping and cut assembly time. The molds are available in working capacities from 300 to 1200 gal., and in two styles, a one-piece and a two-piece model with venting. A removable inspection cover is built into the top of the tank, and the molds are available with baffles or tee tiles as required by local restrictions.



Lift Truck-Trailer

HYSTER CO., 2902 N. E. Clackamas St., Portland 8, Ore., has announced a lift truck, carried behind a transport truck in a specially built trailer. After the lift truck loads the transport, it is driven onto the trailer over a hinged ramp which serves as a tailgate while travelling. When the transport reaches its destination, the lift truck is driven from the trailer to unload it, thus reducing material handling time.



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ASTM Standard Specifications for Ready-Mixed Concrete

NRMCA Recommended Practices for Sampling and Testing, with five ASTM test methods appended.

We have mailed many copies to engineers and architects, who desire to incorporate these quality standards in their specifications, and also to users and prospective purchasers of truck mixers. Please direct requests for copies to the TRUCK MIXER MANUFACTURERS BUREAU, 1325 E St., N.W., Washington 4, D.C.

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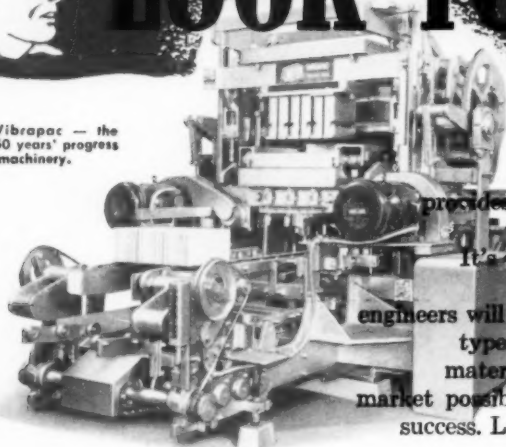
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LOOK TO BESSER for

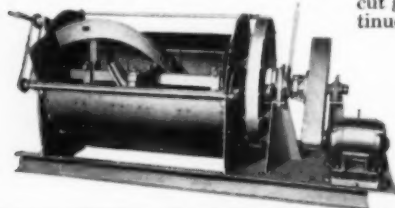
Besser Vibrapac — the peak of 50 years' progress in block machinery.



While the highly efficient VIBRAPAC Machine itself is the heart of the Block Plant, Besser also provides many other units of equipment to help plant operators make the most of VIBRAPAC profit opportunities. It's a wise investment to add this equipment for maintaining VIBRAPAC production at peak profit levels. Besser engineers will be glad to plan your equipment needs, depending on types of aggregate available — topography of your land — material handling needs — curing and storage facilities — market possibilities — and other factors that might influence your success. Look to Besser now for better Block Making Equipment!

BESSER BATCH MIXERS

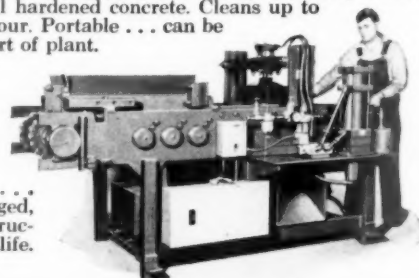
These rugged, quick-charging and self-discharging Batch Mixers are essential to every block plant. Twin spiral blades for fast, thorough, uniform mixing. Blades and liners of X-NI-HARD metal. Steel grid safety cover over mixer drum. Roller bearings. Steel cut gears in continuous oil bath.



STANDARD CAPACITIES:
5-12-18
25-30-40-
50 and 75
Cu. Ft.

BESSER PALLET-CLEANING MACHINE

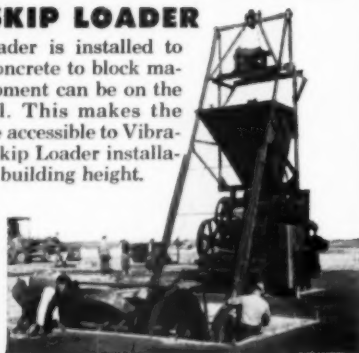
Cleans pallets without warping or nicking. Carboly insert blade removes all hardened concrete. Cleans up to 300 pallets per hour. Portable . . . can be moved to any part of plant.



Fully automatic . . .
noiseless . . . rugged,
heavy-duty construction
assures long life.

BESSER SKIP LOADER

When Skip Loader is installed to elevate mixed concrete to block machines, all equipment can be on the same floor level. This makes the mixer man more accessible to Vibrapac operation. Skip Loader installation saves 14' of building height.



BESSER SUPER STRENGTH BLOCK RACKS

Made in two sizes — 72 or 108 — 8" block capacity. For use with either fork lift truck or platform type lift truck.



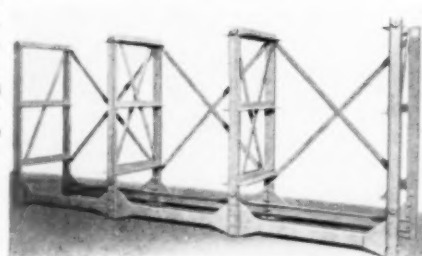
BESSER PLAIN PALLETS

All sizes and styles of block can be made on ONE SET of Plain Pallets . . . Besser originated the Plain Pallet principle.



BESSER ATTACHMENT RACK

A heavy duty steel rack for convenient storage of complete attachments. Saves time and floor space and adds to plant efficiency.



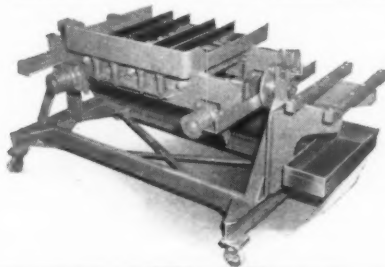
BESSER
50th Anniversary
1904-1954

...a Half Century of Concrete Masonry Progress!

Complete Block Equipment

BESSER ATTACHMENT JIG

Convenient portable roll-over table . . . gives easy access to mold and stripper head for cleaning, changing — adjusting — and tightening bolts. Jig includes two parallel bars for holding Vibrating Shafts for proper assembly and perfect adjustment. Jig also supports stripper head for changing shoes and cleaning.



BESSER CUBING PLATFORM

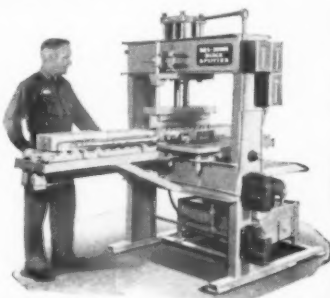
Open steel grating, self-cleaning cube platform has guide for perfect cube forming — eliminates stooping for first tier of block.



Size of platform permits convenient tipping of first tier of block into position for fork lift truck removal.

BES-STONE BLOCK SPLITTER

Splits block in straight line, with speed, precision and safety. Smooth hydraulic action. Easily adjusted to various block heights. Holds block automatically in correct position. Capacity 960 Split-Block per hour.



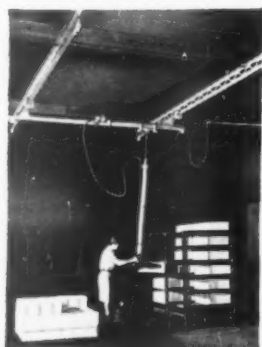
BESSER BRICKVEYOR

The varying speed belts automatically tip brick from vertical to horizontal position for correct cubing positioning. Adjustable inclined gravity roller conveyor accumulates rows of brick for brick clamp handling. Capacity 60,000 per day.



BESSER BRICK CLAMP

(shown at right) assures fast, safe handling of concrete brick from brickveyor to cube. Interchangeable with block cubing clamp. Picks up 32 or more brick.

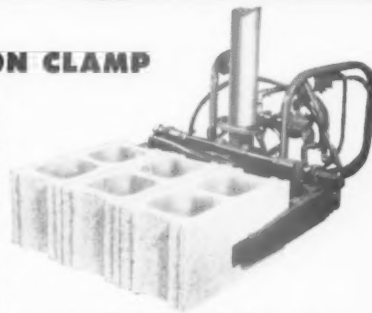


BESSER Bridge-Crane BLOCK-CUBER

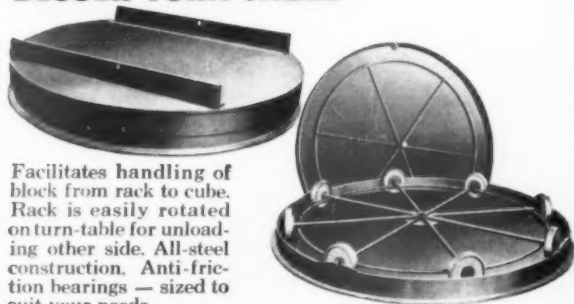
Eliminates lifting block by hand. Pneumatic clamp and hoist remove three 8" block (or equivalent) from rack. Operator merely guides hoist in building a cube stack for lift truck transportation to yard. Simplifies inventory count. Neat stockpiling; saves yard space. Speeds truck loading.

BESSER COMBINATION CLAMP

Handling of block or brick from rack to cube is easy with this clamp. Convenient operating levers eliminate finger fatigue and simplify removal of block from highest and lowest tiers. To change from block clamp to rubber faced brick clamp, merely remove two bolts in each clamping arm. Lightweight and rugged.



BESSER TURN-TABLE



Facilitates handling of block from rack to cube. Rack is easily rotated on turn-table for unloading other side. All-steel construction. Anti-friction bearings — sized to suit your needs.

Modern 2-core and 3-core VIBRAPAC BLOCK . . . have high tensile strength at center. Wide end flanges with deep mortar grooves for weather tight head joints. Concrete is scientifically distributed in the face shell for lightweight and maximum strength.



BESSER COMPANY • Alpena, Michigan, U.S.A.

PREVENTIVE Maintenance In the Ready-Mixed Concrete Industry

By JAS. A. NICHOLSON*

26: A producer views the ready-mixed concrete business

THE READY-MIXED CONCRETE OPERATOR with his eye on the ball, keeps close check over his maintenance program. In some years' operations, proper maintenance may be the difference between profit and loss. Although individual problems vary, everywhere costs are sizable. A producer, who operates a large fleet of truck mixers, reported that in 1952 he had spent \$95,000 in maintaining his delivery equipment. As compared with 1945 figures, some producers report 50 percent or greater increases in maintenance costs. Such increases represent a terrific drain upon profits. Alert management is necessary to keep both problems and costs under control. In our industry, especially on delivery units, high maintenance costs are apt to be the rule almost from the beginning use of new equipment.

The development and operation of an efficient maintenance program can only come through the close coopera-

tion of the ready-mixed concrete producer, plant operator, equipment superintendent, driver, dispatch clerk, greaser and mechanic. Two essentials are communications and team play.

In these articles on maintenance, we are primarily concerned with plant and delivery equipment, in which ready-mixed concrete producers have a good many millions of dollars invested. A well executed maintenance program means fewer breakdowns and accidents, less downtime, a reduced "parts" bill, substantial savings in operating costs, better concrete and great improvement in customer service.

The maintenance program of a ready-mixed operation more or less separates naturally into four phases:

1. General maintenance, including painting, and building repairs.

*Pres., Nicholson Concrete Co., Toledo, Ohio.

2. Minor alterations that may be desirable but not necessary, (e.g. improvements for more efficient operations.)
3. Maintenance of plant equipment.
4. Maintenance of delivery equipment.

Both general maintenance and minor alterations should be planned in advance with costs carefully estimated and approval required before proceeding with work. While it seems a relatively simple matter to keep such problems under close control, on one occasion we gave approval for a \$700 change that developed into a \$5000 expense. We also had a situation where considerable repair work, including modification, was done unnecessarily on a structure that we had planned to move. On repair work of these two classifications, one person in the organization should be given the responsibility for decisions.

Two Kinds of Maintenance

Generally speaking, there are two kinds of maintenance — (a) preventive and (b) operating. When you correct a condition before a unit fails in its proper functioning, you are practicing preventive maintenance. When you repair a machine to keep it going, you are doing operating maintenance. The start in making money, limiting downtime and improving service is when you change over from the confusion of always making repairs to a policy of preventive maintenance.

Throughout its lifetime, ready-mixed concrete equipment is given hard, rough usage. Operators work to tight production and delivery schedules. When needed, equipment must be "ready to roll." Breakdowns and downtime sharply affect operating costs. The principal reason for regularly servicing equipment is to prevent major repairs and unnecessary downtime. The burden of maintenance, repair and replacement of equipment may well mean a profitless year. The only way to keep costs in line and to daily give efficient service is to set up and carry out a carefully planned preventive maintenance program.

Bob Bremmer of the T. L. Smith Co. says "Preventive maintenance begins the day that the railroad delivers

(Continued on page 156.)

● HAVE YOU AN EFFICIENT PREVENTIVE MAINTENANCE PROGRAM? Has one person been delegated the responsibility and does he have the necessary authority? Are you regularly scheduling inspection of plant and delivery equipment? Is all equipment getting proper lubrication attention? In lubricating equipment are you using multi-functional oils and greases? Do you plan ahead for overhauls and repairs? Are you holding regular maintenance meetings? Are you keeping necessary records? Are you keeping track of repairs and downtime on all individual pieces of equipment? Are you effectively using good maintenance forms? How efficiently are you controlling maintenance expense? Are you really facing the problems of truck downtime and plant breakdown? How trustworthy are your cost figures? Are you separating true maintenance duties from odd jobs increasingly performed by maintenance employees? Do you have a maintenance budget? Should one be considered? Are you getting the most out of your maintenance dollar?

Try to get the most out of your maintenance dollar by:

1. Providing proper facilities for efficient handling of maintenance work.
2. Placing responsibility with a capable man to supervise work of competent, interested maintenance employees.
3. Making maintenance people feel that their jobs are highly important.
4. Carefully planning regularly scheduled inspection, lubrication and other preventive maintenance work.
5. Making repairs before equipment breaks down.
6. Having necessary parts and material on hand to cut down travelling costs on maintenance duties.
7. Doing regular maintenance work during straight time hours of labor.
8. Insisting upon job order for each maintenance job requiring more than one hour of labor.
9. Setting up a record control system to keep track of costs and results.
10. Using charts, graphs and other means to spot high-uptime equipment.

Whitest



Whitest in the bag

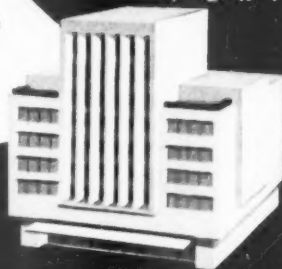
THE WHITEST WHITE BY ANY STANDARD

Trinity White Portland Cement is whitest in the bag . . . whitest in the mix . . . whitest in the completed job. You can see the difference! This is a true portland cement—it works the same as any portland—looks much better. The extra whiteness of Trinity White has made it a favorite of architects. Ask your dealer for Trinity Brand White Cement when you are making architectural concrete units, stucco, terrazzo or any other concrete where whiteness or purity of color is important.

A product of GENERAL PORTLAND CEMENT CO.
CHICAGO • DALLAS • CHATTANOOGA • TAMPA • LOS ANGELES

Trinity White

PORTLAND CEMENT



Whitest in the completed job

As white  as snow

Here's how a GERLINGER CARRIER "ADDS UP" for this Manufacturer:



Lower
Handling Costs



Less Block
Breakage



More Trips
Per Day



GREATER
PROFITS

L. M. Kennedy & Sons deliver concrete blocks with their Gerlinger Carrier anywhere within a 25-mile radius of their Philadelphia plant. The Gerlinger each trip delivers 6-ton loads of 400 blocks directly to the customer's job, spotting the load within arm's reach of the block layers. A special power attachment enables the carrier operator to gently unload the blocks, with the cube load remaining intact. The firm reports that the use of the Gerlinger Carrier has tripled the number of deliveries it can make—over its former conventional delivery method. Block breakage in transit has almost entirely been eliminated.

Gerlinger Carriers are built to handle such heavy loads—with easy maneuverability in city traffic and surplus power for traction over rough terrain. Full-visioned operator's seat gives full view of load and road. These—and other job-proven features—make Gerlinger Carriers all-purpose, cost-cutting material handlers. For specific data to fit your operation drop us a card today.

Four hundred 30-lb. concrete blocks are loaded on the Gerlinger by lift truck in this unique application in the yard of L. M. Kennedy & Sons.



Lower: Minutes later this giant load is delivered intact to customer's job within easy reach of workmen.



G-250

GERLINGER CARRIER CO., DALLAS, OREGON



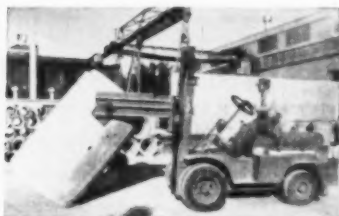
A modified hydraulic clamp attachment, with pivoted pads fitted to the clamp arms, enables a fork truck to carry large dimension concrete pipe in an up-right position.

How to Handle Upright Pipe the Easy Way!

Take any tough problem . . . like the one Twin City Concrete Pipe Company faced. Large dimension concrete pipe, after manufacture, must be placed up-right in drying kilns. In the past, workmen pulled dried pipe over on its side so Clark trucks could insert their forks for kiln removal. An impractical method . . . and costly, since it was time consuming and large quantities of pipe were damaged in the process.

The ingenuity of Clark and Twin City engineers found a solution. A modified hydraulic pipe attachment was developed that made it possible for one fork truck and one man to handle the entire operation! As a result, production was speeded up . . . merchandise damage eliminated . . . and materials handling costs reduced to a minimum!

Why not call your local Clark dealer, listed under "Trucks, Industrial" in the Yellow Pages? His business is low-cost materials handling . . . it's smart business to make him a member of your management team.



To lay pipe on its side for horizontal carrying, the driver lowers clamp arms and drives in reverse at the same time. The pads pivot as the pipe goes down.



For horizontal handling, clamp arms are closed and inserted into pipe. The top rod is cut back 10-inches on top of clamp arms so no weight is exerted on the tongue while pipe is in this position.

CLARK[®]
EQUIPMENT

**Industrial Truck
Division**

CLARK EQUIPMENT COMPANY

Battle Creek 60, Michigan

Preventive Maintenance

(Continued from page 154)

your plant or mixers. It stops the day you get too busy making money to protect the money that you've already made and put into capital investment."

To help you determine whether your preventive maintenance program is operating efficiently, check the following: (1) yardage production per hour, day, week and month; (2) concrete delivered daily, weekly and monthly by each truck; (3) relation of deliveries to commitments; (4) service complaints; (5) overtime repair costs; (6) downtime on truck mixers; and (7) work stoppages due to plant breakdowns.

Everybody admits that preventive maintenance will prevent downtime, reduce repair costs and prolong the usable life of equipment. Too few operators are willing to make the continuing effort necessary to plan and carry out an effective preventive maintenance program. Preventive maintenance cannot be a sporadic affair to be practiced only during the slack season period or whenever a series of breakdowns has briefly drawn the attention of the front office. To be successful, a preventive maintenance program must be a well grounded policy of the company.

Preventive Maintenance Fundamentals

Certain fundamentals are basic. The prime responsibility for equipment maintenance should be assigned to the man responsible for overall operating costs. This key employee should have a leading voice in the selection of equipment and in all matters pertaining to operating personnel. The equipment superintendent must be willing and able to delegate adequate authority; e.g., the man charged with the responsibility of regular lubrication must be able to route the equipment to the proper place at the designated time. Appropriate facilities must be able to handle preventive maintenance and necessary repair work. An efficient control record system must be provided. Nothing should be left to chance.

Maintenance and repair facilities should be adequate for the size of the operation. With major work done in outside shops, a limited amount of lubrication equipment and a relatively few tools will handle a small fleet satisfactorily. On the other hand, many producers employ sufficient equipment to justify the establishment of a completely equipped shop.

A producer, doing general maintenance work in his garage should pro-

(Continued on page 158)

the new
CHALLENGE
Pacemaker



Value Standard of the Industry

KENT LINTELATORS

Now Available in Sizes



UP TO 12'

Kent Lintelators have been outstandingly successful from the start.

They produce strong lintels with block texture and have been accepted by builders wherever introduced.

They afford the fastest, least costly method of producing quality lintels.

And with their constantly growing acceptance has come demands for machines to produce larger and larger lintels.

The latest Lintelator now available produces lintels up to 12 feet long and embodies all the advantages of the smaller machines.

An important item is the fact that the large machine can also produce a range of shorter lintels efficiently since the end members of the mold are adjustable.

See Us At Booths 76-77-112-113—NCMA CONVENTION

The **KENT MACHINE COMPANY**

CUYAHOGA FALLS, OHIO

CONCRETE PRODUCTS MACHINERY SINCE 1925

Canadian Distributor: Wetlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

vide certain facilities for his mechanics and greasers. There should be included such items as a pit or hydraulic lift, air compressor, overhead or off-the-wall lubrication equipment, gear lubricant dolly, several hand lubricating guns, wheel bearing packer, adequate tire repair equipment, pressure steam cleaning unit, welding outfit; necessary tools, including a heavy duty socket set, quick battery charger and a bench lathe. A spark plug tester and cleaner should be provided together with proper motor tune-up equipment of the portable type. The latter should include the following: vacuum gauge two-way meter (vacuum and pressure), cam-angle, tachometer, voltage and amperage meters as well as a coil and condenser tester.

In the present trend toward area operations, difficult problems have arisen over the control of the preventive maintenance program. A major problem has developed over how to service the equipment — whether to bring the rolling stock to one central garage, use a traveling (truck mounted) lubricating service set-up or provide lubrication facilities at each plant. The general opinion seems to be that it is advisable to centralize lubrication and mechanical work, thus requiring trucks to be so routed as to end up at the central shop on the day and time scheduled for preventive maintenance attention.

Regardless of the methods used to generally handle maintenance work, two "musts" should be provided at all operating plants. A spray gun should be available to apply a light film oil to the drum exterior and a high pressure hose should be on hand that is capable of removing semi-hardened concrete and grout from mixer surface, gates and discharge spouts. For both appearance and operating efficiency, truck mixers, under all conditions, must be kept clean.

Concrete Surfacing Material

THE GEORGIA INSTITUTE OF TECHNOLOGY has announced the development of a concrete surfacing material which reportedly will bond to almost any surface, including concrete, masonry, tile, wood, metal and even glass. The material is made by the substitution of liquid rubber for much of the water in the cementitious mixture. There are two types of latex used, one to establish high grease and oil resistance, and the other for water-proofing. Another feature claimed for the product is its non-skid resiliency. It reportedly can be used as a terazzo only 1/4 in. thick, and is being developed for floors, roofing, plaster and stucco, although expectation is that it also will be adapted for many other uses.

MAKE MORE MONEY MAKING

**"THE LARSEN
"LIFETIME"
FENCE POST**

Add this profit-making item to your present line. It makes a perfect fill-in for odd times—and can readily be developed into a major production unit. You can start with a few molds and add more as your business grows.

Write for FREE Bulletin RS4.

CONCRETE POST FORM COMPANY

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Cedar Falls, Iowa



ROCK
PRODUCTS
FEATURES
TIMELY
INDUSTRY
NEWS
EACH
ISSUE

LONGEST PRESTRESSED CONCRETE SPAN IN WESTERN HEMISPHERE



CUYAGUATEJE RIVER BRIDGE is the fourth maintenance-free prestressed concrete bridge completed in Cuba in the last two years — and also the longest and most graceful. The twenty-eight 1-11/16-inch diameter galvanized Roebling Prestressed Concrete Strands which provide the main tensioning force were coated with bituminous paint after erection and are expected to last indefinitely in the dead air space of the span's hollow box. They are readily accessible for inspection, however, and could be replaced at any future time.

The use of these Roebling Strands in a hollow box assures uniform tension by eliminating nearly all friction during the tensioning process. This is especially important for long spans carrying heavy loads, and for continuous structures where reverse curvatures create high friction in other types of tensioning elements.

Roebling engineers, pioneers in the development of prestressing techniques and tensioning elements in America, are always ready to offer suggestions to help attain best results on any prestressed concrete application. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

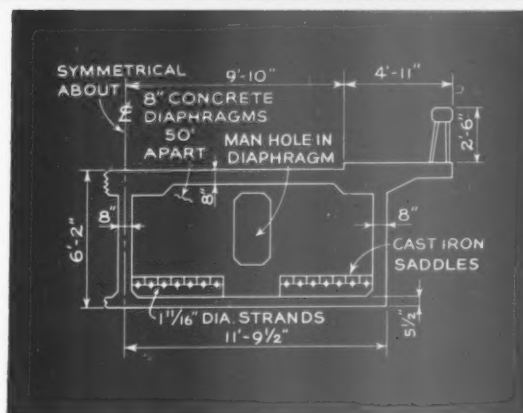


Photo: This graceful prestressed concrete hollow box spans the Cuyaguatete River near Pinar Del Rio. Main span, 295 feet center to center of piers; overall length, 383 feet; live load, AASHO-H20-44... *Top blueprint:* Dotted line shows trajectory of the prestressing strands. *Lower blueprint:* Cross-section at center of main span including location of strands and manhole in diaphragm.

Bridge designed by Comision De Fomento Nacional De Cuba under supervision of Ing. Civil Luis Saenz, Designer and Chief Engineer; constructed by Compania Constructora Munilla, Ing. Civil Fernando Munilla, Director.

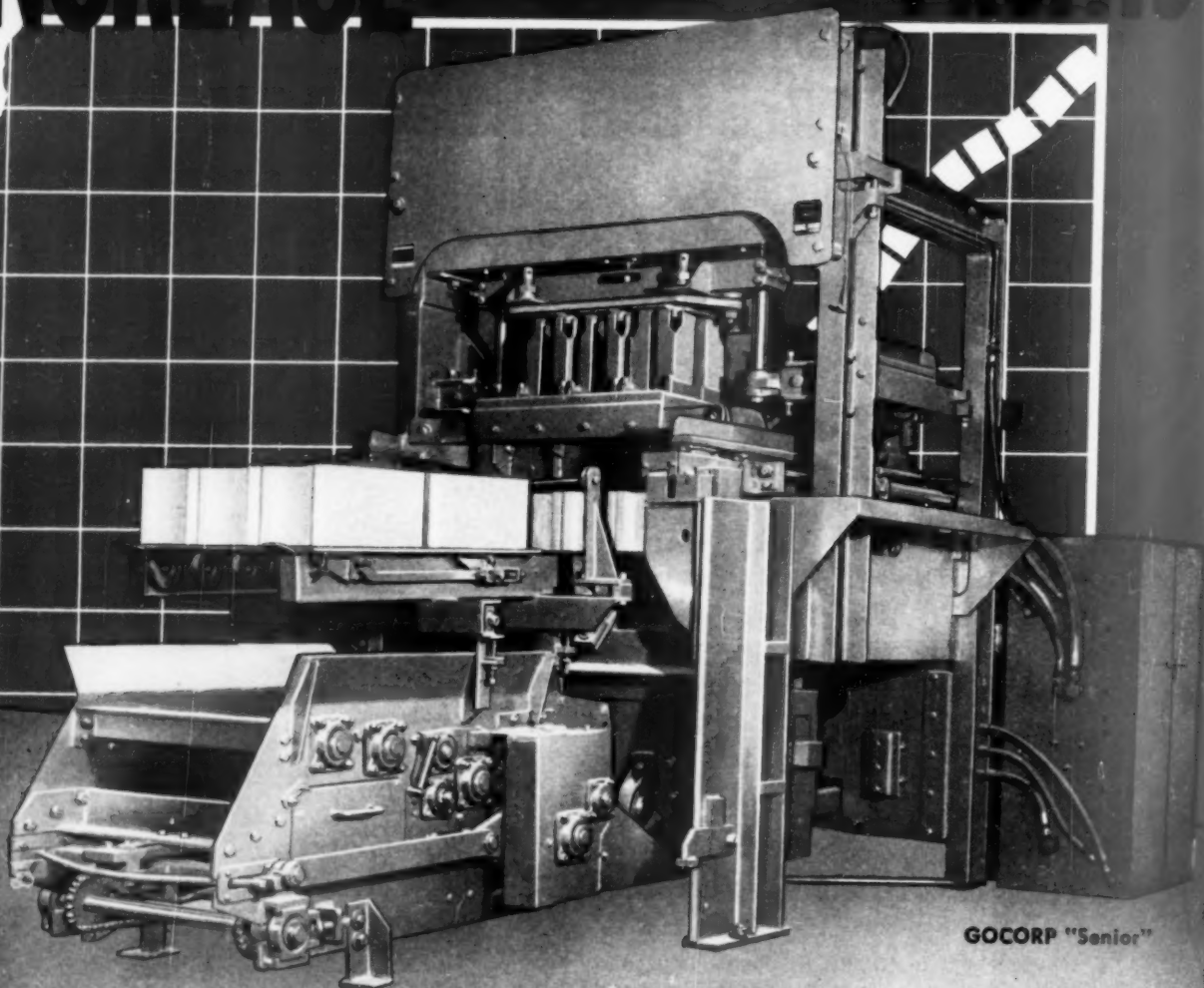


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Subsidiary of The Colorado Fuel and Iron Corporation

INCREASE YOUR YEAR END PROFITS



GOCORP "Senior"

with a GOCORP

HERE'S HOW GOCORP DOES IT—

- **Direct Feed** from main supply hopper to mold (no old fashioned feed drawer) plus intense vertical vibration (pallet clamped to mold) assures a uniformly dense unit.
- **Sequence Operation** for easy adjustment and greater production. Under Machine Pallet Return—saves space and reduces labor costs with one man operation.
- **Hydraulic Drive**—Smooth trouble-free performance—reduces maintenance. GOCORP'S Johnny-on-the-spot factory trained men for help when you need it.
- **Advanced Design** gives you "Tomorrow's machine today."

Because GOCORP Plain Pallet Machines (The King and the Senior—3 or a time illustrated) give you a quality product that brings you new orders ✓ quantity production for lower unit production costs ✓ reduced maintenance and uninterrupted production allowing you to keep the profits you've made.

AND with a GOCORP there's no fear of obsolescence.

For complete information on plain pallet machines, batch mixers (12 to 75 cubic foot capacity), pipe and tile machines, or junior cored pallet block machines write or phone today.

GOCORP

ADRIAN-MICH.

2000 Grand Street

Adrian, Michigan

Expanded Shale Institute Annual Meeting

THE BOARD OF DIRECTORS of the Expanded Shale Institute held its third annual meeting September 29 through October 1 at the Sheraton hotel in Chicago, with President Warren W. Allen of St. Louis presiding.

Interim reports were made on research programs now under way and new research programs scheduled to be carried out over the next few years. The members were pleased to receive favorable reports on research in progress.

Of particular interest was the Institute's recently completed performance survey of expanded shale concrete for bridge decks. This survey covers 45 bridges built over the past 20 years. The Publications and Promotion Committee referred to letters from enthusiastic engineers commenting on the service this survey will render the construction industry and especially the timeliness of this survey in view of the huge roadbuilding program beginning in this country today.

The Publications and Promotion Committee recommended consolidation and publication of more information for the use of concrete masonry with emphasis on use in housing. They further recommended that more space in the Institute's publication, *Concrete Facts*, be devoted to concrete masonry.

The Directors of the Institute spent half a day visiting the Portland Cement Association's laboratories at Skokie, Ill., where they were shown a number of research studies underway, including the various phases of expanded shale concrete.

At the dinner for the members and their wives and guests, S. Carl Smithwick, immediate past president of the Institute, was presented a gold desk set from the Institute members for his very outstanding service to the Institute and its goals, with a resolution passed by the Directors expressing the

appreciation of the Institute for his services to the industry.

Guests at the banquet were S. H. Westby, manager of the Housing and Cement products bureau, Portland Cement Association; J. P. Thompson, Structural bureau, Portland Cement Association; Carl Ziegler, manager of the Educational Films bureau of the Portland Cement Association; William P. Markert, director of promotion, National Concrete Masonry Association.

BARBER'S CEMENT BLOCK PLANT has been established at Zephyrhills, Fla.

Hydraulic Lime Concrete

CONCRETE made with a hydraulic lime as binder had been exposed to tide action in Oran for 30 years. The calcium was progressively displaced by magnesium. Where tides are absent, many concretes made from hydraulic lime stand up quite well and make a showing quite favorable as compared with portland cement, since the aluminate in the latter reacts with sulfate to cause expansion. These observations were made by M. Duriez in *Revue de Materiaux*, No. 431, p. 105, April, 1953.

You Will Make Money With TRUAX Equipment

TRU-PAX

Block Machine

- Fast
- Automatic
- Engineered

Investigate the low cost of the TRUAX Block Machine and High Production. Built to last and produce a high quality block.

Write for Details

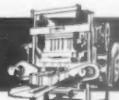
TRUAX CONCRETE EQUIPMENT Includes:



LIFT TRUCKS



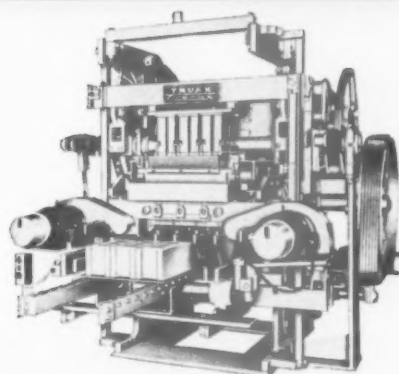
BLOCK SPLITTERS



BLOCK MACHINES



AUTOClaves



TRUAX

MACHINE and TOOL CO.

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FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

THE Quinn Standard

Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

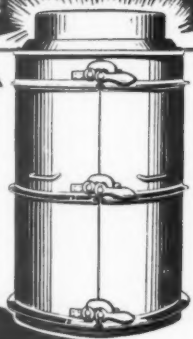
• QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired.

WRITE TODAY for complete information and estimates.

Also manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS
EGGON, IOWA



NOW MORE THAN 140 LICENSED MANUFACTURERS Producing

Patented homeward Concrete STEPS

A small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.



The exclusive franchise for your territory may still be open.

For Complete Information Write

ROGER F. WILLIAMS, Licensor

3420 S. W. 9th St.

Des Moines (15), Ia.

Pipe School

(Continued from page 149)

ure of a 72-in. tongue and groove pipe line he had observed in an air force project. He said that improper bedding had resulted in the opening of almost every joint in a mile of line.

Calcium Chloride Research

William E. Dickinson of the Calcium Chloride Institute, Washington, D. C. described research being done on the effect of calcium chloride in concrete. He said the effects included reduction in time of both initial and final set and more than double the one-day strength. He said that calcium chloride should not be regarded as an anti-freeze although it has a very low freezing point in a concentrated solution. In the quantities recommended for concrete it has very little effect in lowering the freezing point, the speaker said.

Joseph M. Fuller of Erickson Power Lift Truck, Inc., presented colored slides showing the "Power Kart" in action in a pipe plant.

Panel Discussions

The entire time of the third day was occupied with panel discussions of 50 questions about the making and use of concrete pipe that had been

sent into A.C.P.A. headquarters during the year.

E. F. Bepalov was Moderator at the morning session. Panel members were: Harry E. Easterly, Jr., executive vice president, Concrete Pipe and Products Co., Richmond, Va.; George B. Richmond, vice president, Union Concrete Pipe Co., Ceredo, W. Va.; Craig J. Cain, vice president, Continental Concrete Pipe Corp., Chicago and Don Oswald, Concrete Conduit Co., Colton, Calif.

A question on safety elicited the most enthusiastic response at the morning session.

A question on autoclave curing stimulated lively discussion. The question was: "Did anyone try to cure pipe in an autoclave, either experimentally or otherwise?" Mr. Tormey expressed the opinion that although autoclave curing increased strength, it was not economically feasible for pipe.

Harry E. Easterly said autoclave curing gave greater strength.

Prof. Dalton G. Miller of Minnesota, speaking from the floor said autoclave concrete will be stronger and more resistant to aggressive soils.

Carl A. Bluedorn, president of the Zeidler Concrete Products Machinery Co., Waterloo, Iowa, was Moderator of the afternoon panel. Other panel members were: Tom A. Thomas, man-

ager the Ada branch of Thomas Concrete Pipe Co., Oklahoma City; Howard N. Sokol, president Sibley Cement Co., Sibley, Iowa; John F. Lowe, Jr., secretary Associated Concrete Pipe Co. of Florida, Miami, Fla.; C. F. Meanwell, vice president Superior Products Co., Detroit, Mich. and Harry H. Tormey of Jahnke Service, Inc., New Orleans, La.

The question, "Do some highway departments lay concrete pipe culverts with open joints?" created considerable interest. John A. Ruhling of the Washington office of the A.C.P.A. reported that 18 states do not require joints to be mortared. In British Columbia, it was reported, joints up to 48-in. pipe are left open.

Questions on the trend in length of concrete pipe joints and about ways to unload pipe aroused interest.

Moderator Bluedorn said he believed the trend is toward greater lengths but that hauling is a problem.

Considerable interest was shown in a question as to the commercial use of low frequency, high amplitude vibrators with a dry mix. H. H. Schmidgall of Hancock Concrete Products Co., Hancock, Minn., said his company uses two such vibrators mounted on the outside of forms in making 15-in. to 54-in. pipe. Forms can be stripped immediately, he said.

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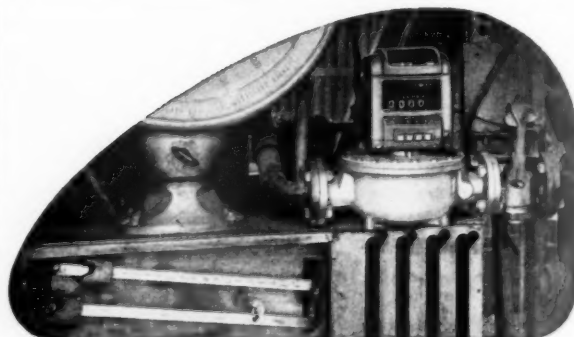
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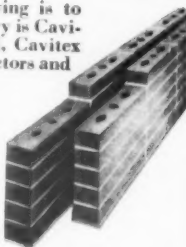
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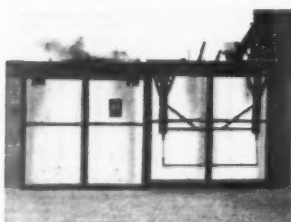


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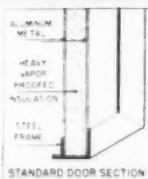


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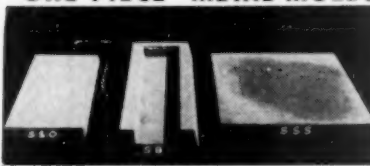
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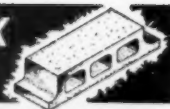
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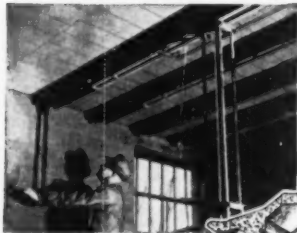
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BOX M-76, ROCK PRODUCTS
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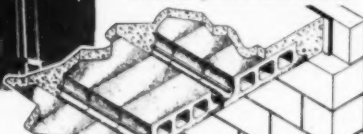
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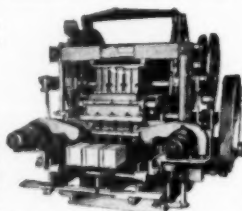
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material and bonding with wall.



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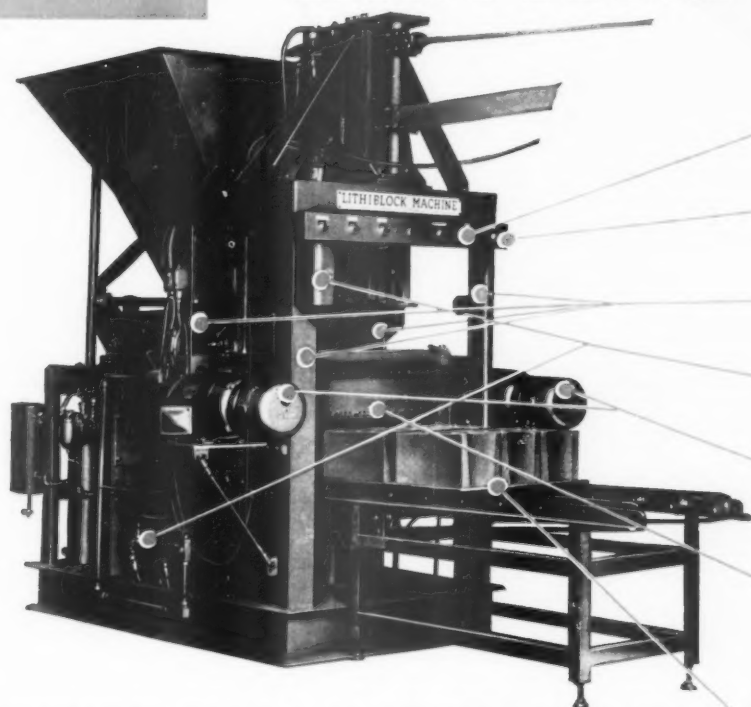
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8

IMPORTANT REASONS

WHICH HAVE INFLUENCED HUNDREDS
OF BLOCK PLANT OWNERS TO SWING TO

LITH-I-BLOCK MACHINES



TAMP OR PRESS OR DO
BOTH IN SAME CYCLE TO
ASSURE UNIFORM TEXTURE

FULLY AUTOMATIC,
SEMI-AUTOMATIC OR
MANUAL OPERATION

4-POINT HEIGHT CONTROL
INSURES TOP AND BOTTOM
SURFACES PARALLEL

POSITIVE ELECTRONIC
CONTROLLED FEED DRAWER
AND STRIPPING ACTION

INDIVIDUAL CONTROL
SPEED AND DIRECTION
OF VIBRATOR UNITS

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TWENTY MINUTES

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AND SIZES OF BLOCK

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WITH SAND AND GRAVEL.
MORE WITH LIGHT AGGREGATE

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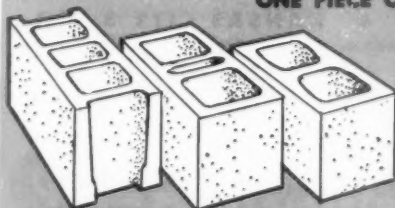
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A Product of
THE LITH-I-BAR COMPANY
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MACHINE

LITH-I-BAR CO.

HOLLAND, MICH.

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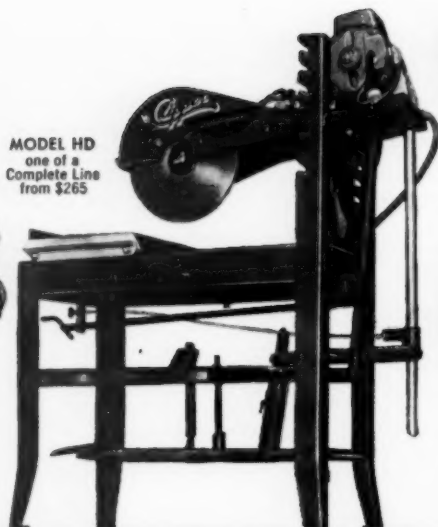
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Complete Line
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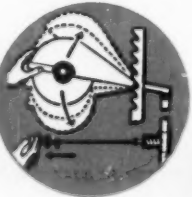
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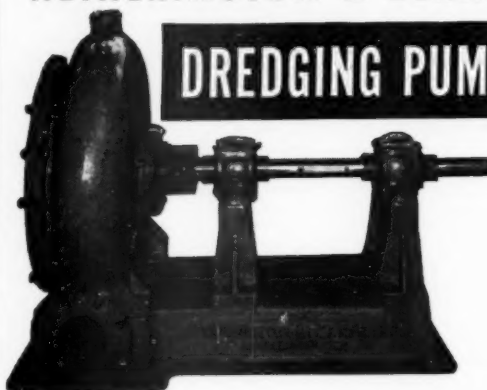
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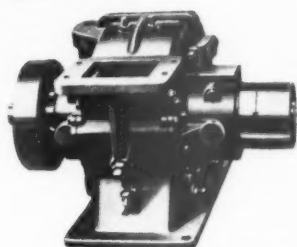
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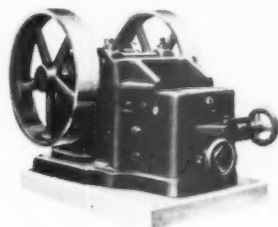
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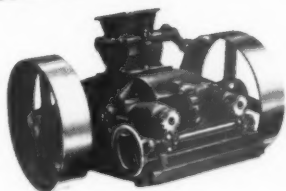
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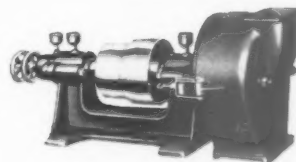
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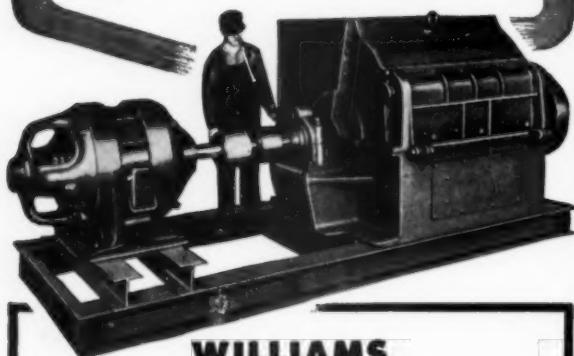
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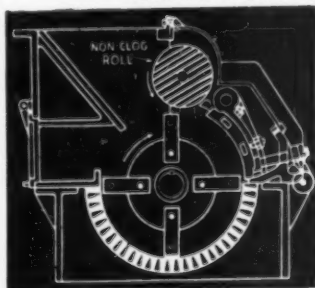
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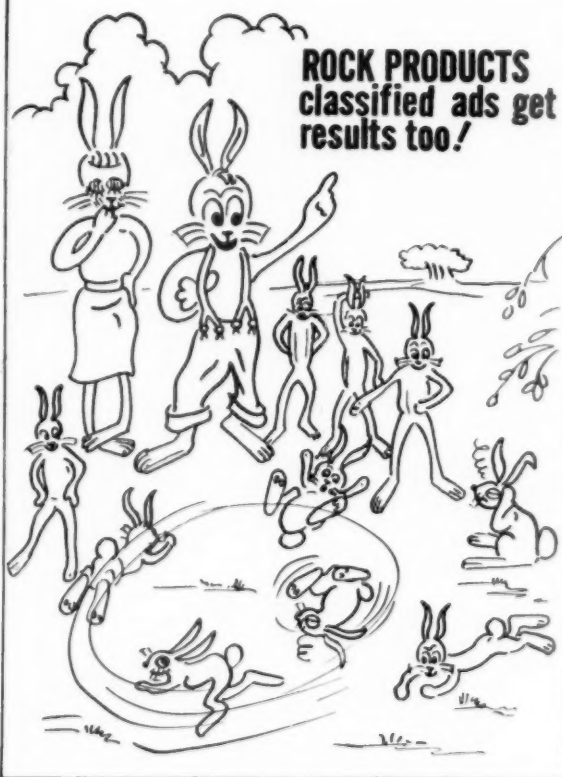
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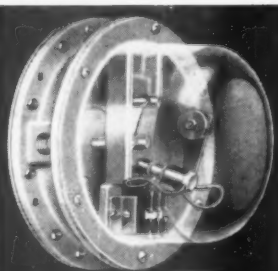


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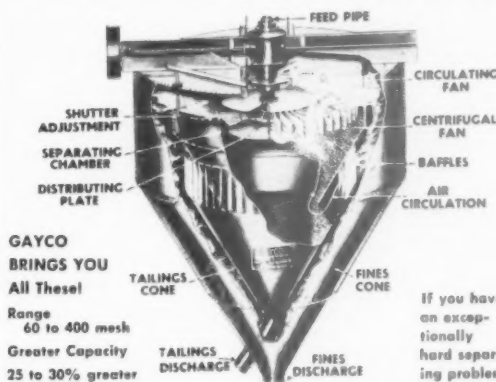
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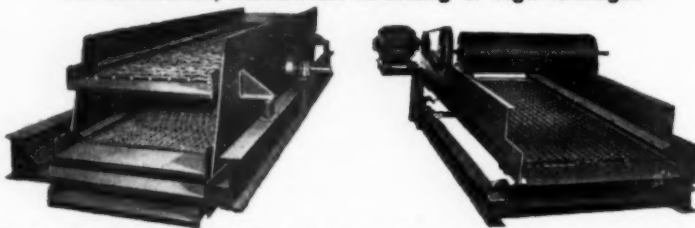
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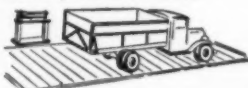


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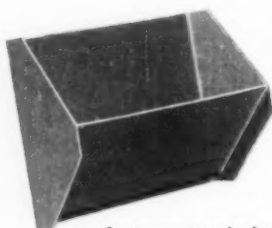
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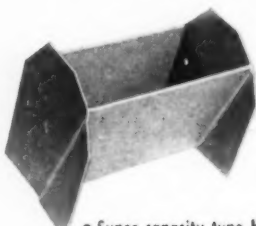
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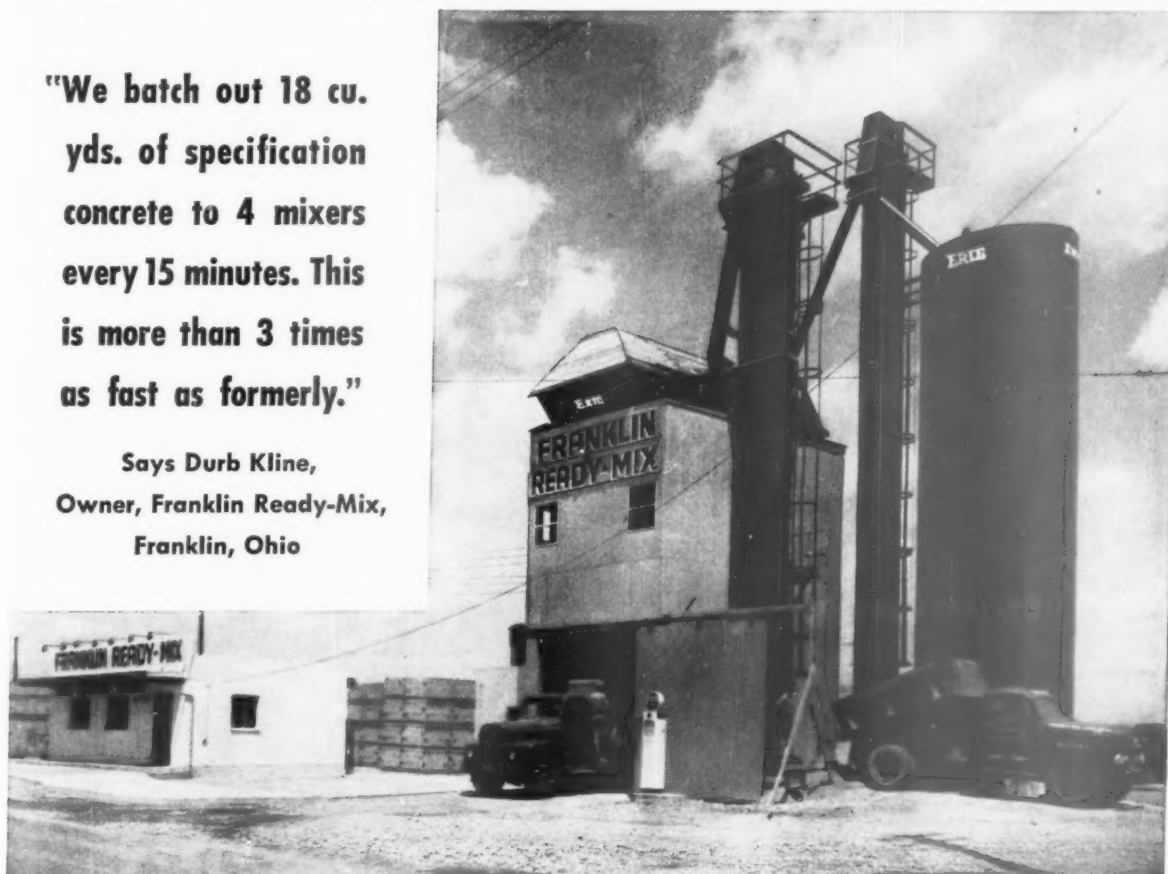
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